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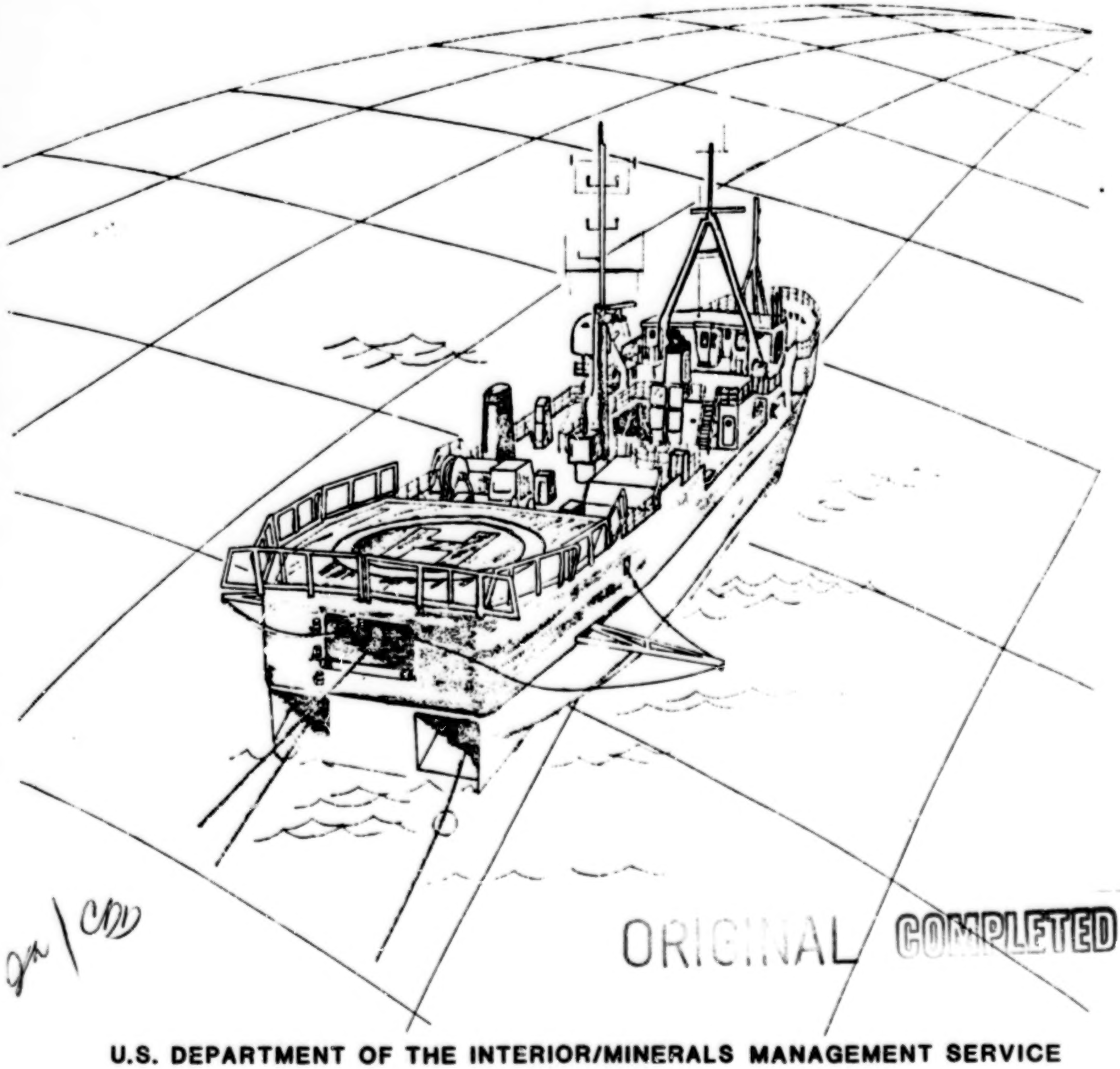
ENVIRONMENTAL ASSESSMENT

For Geological and Geophysical Exploration Activities On The Outer Continental Shelf

**GULF OF MEXICO
OUTER CONTINENTAL SHELF
REGIONAL OFFICE**



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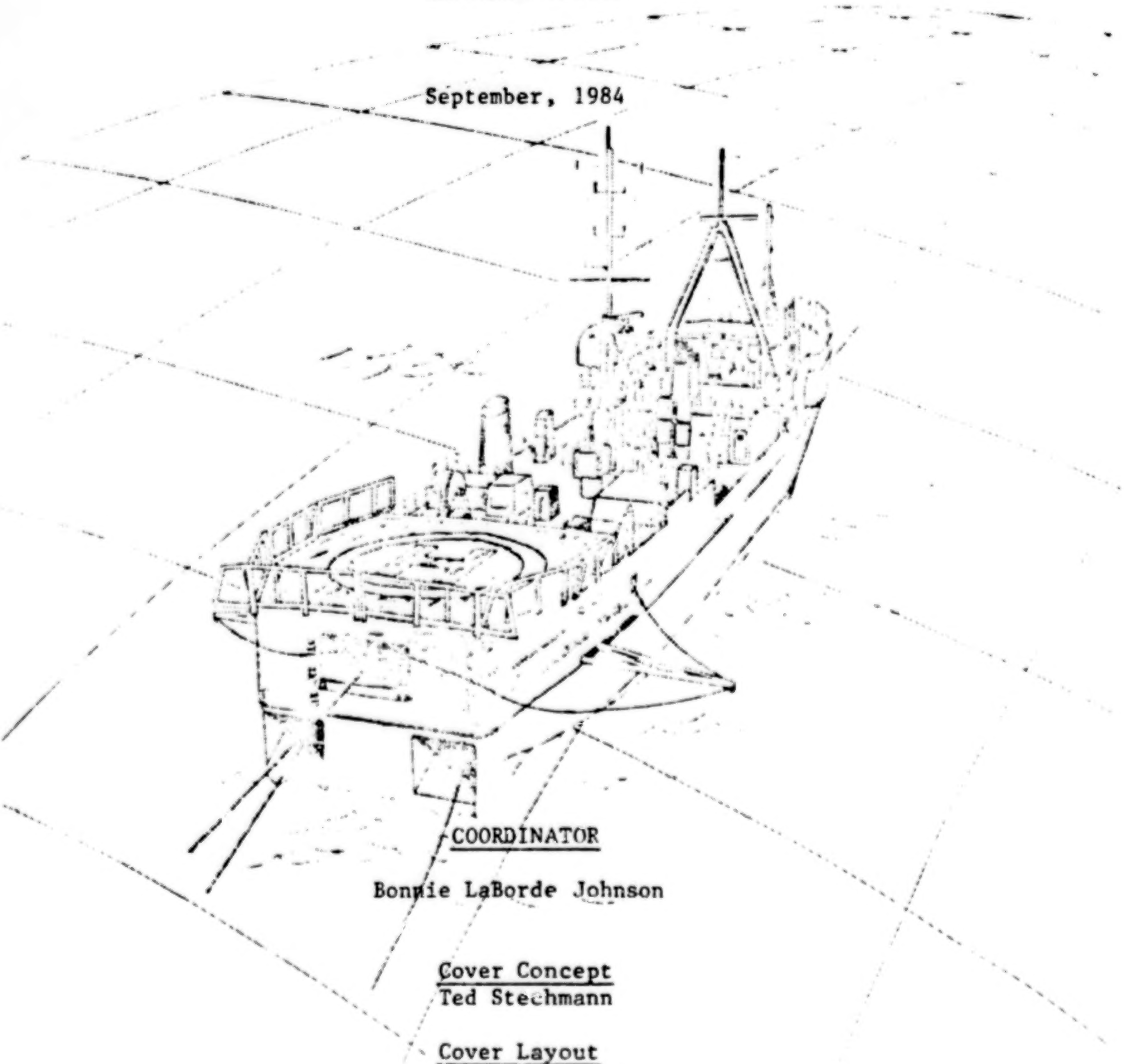
ENVIRONMENTAL ASSESSMENT

for
Gulf of Mexico Outer Continental Shelf
Geological and Geophysical
Exploration Activities

Prepared by the
MINERALS MANAGEMENT SERVICE
GULF OF MEXICO
OUTER CONTINENTAL SHELF
REGIONAL OFFICE



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ABBREVIATIONS AND ACRONYMS

CDP	Common Depth Point
DOD	Department of Defense
DST(s)	Deep Stratigraphic Test(s)
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMC	Electronic Counter Measure
FONSI	Finding of No Significant Impact
G&G	Geological and Geophysical
GOM	Gulf of Mexico
LE	Leasing and Environment
MMS	Minerals Management Service
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
OCS	Outer Continental Shelf
RE	Resource Evaluation
REIS	Regional Environmental Impact Statement
RS	Regional Supervisor
SEA	Site-Specific Environmental Assessment
SIC	Standard Industrial Classification
USEPA	U.S. Environmental Protection Agency

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INTRODUCTION

This programmatic Environmental Assessment (EA) has been prepared for geological and geophysical (G&G) activities, including the conducting of exploration for mineral resources or scientific research involving the use of liquid or solid explosives and the drilling of deep stratigraphic test (DST) holes on the Gulf of Mexico (GOM) Outer Continental Shelf (OCS) (Figure A). It will serve as a base document for the preparation of future environmental documents.

Pursuant to Appendix 10 of 516 Departmental Manual Part 6, certain actions are categorically excluded from the National Environmental Policy Act (NEPA) process, including approval of OCS G&G activities. Exceptions to the categorical exclusion process are those activities which include the drilling of DST holes, involve the use of solid or liquid explosives, or which otherwise have the potential to significantly affect the quality of the human environment. A Site-specific Environmental Assessment (SEA) will be prepared for these activities and will contain site-specific and updated information not presented in this EA. Sections of this EA which will be covered or supplemented in an SEA are indicated throughout the text.

In compliance with the NEPA, this EA/SEA concept implements the tiering process defined in 40 CFR 1508.28 which promotes referencing of general information and emphasis on more significant issues to be addressed in a site-specific analysis. The SEA will conform to the guidelines for preparing EAs in compliance with the requirements of 30 CFR 250.34 and the NEPA, incorporating by reference information presented in the base document (EA). The preparation of a Finding of No Significant Impact (FONSI) will be based on the conclusions reached in the SEA prepared for a specific proposal. Therefore, specific conclusions regarding the significance of environmental impacts will be incorporated into the text of the SEA rather than the EA.

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UNITED STATES DEPARTMENT OF THE INTERIOR

MINERALS MANAGEMENT SERVICE

GULF OF MEXICO OCS REGION

ENVIRONMENTAL ASSESSMENT AREA

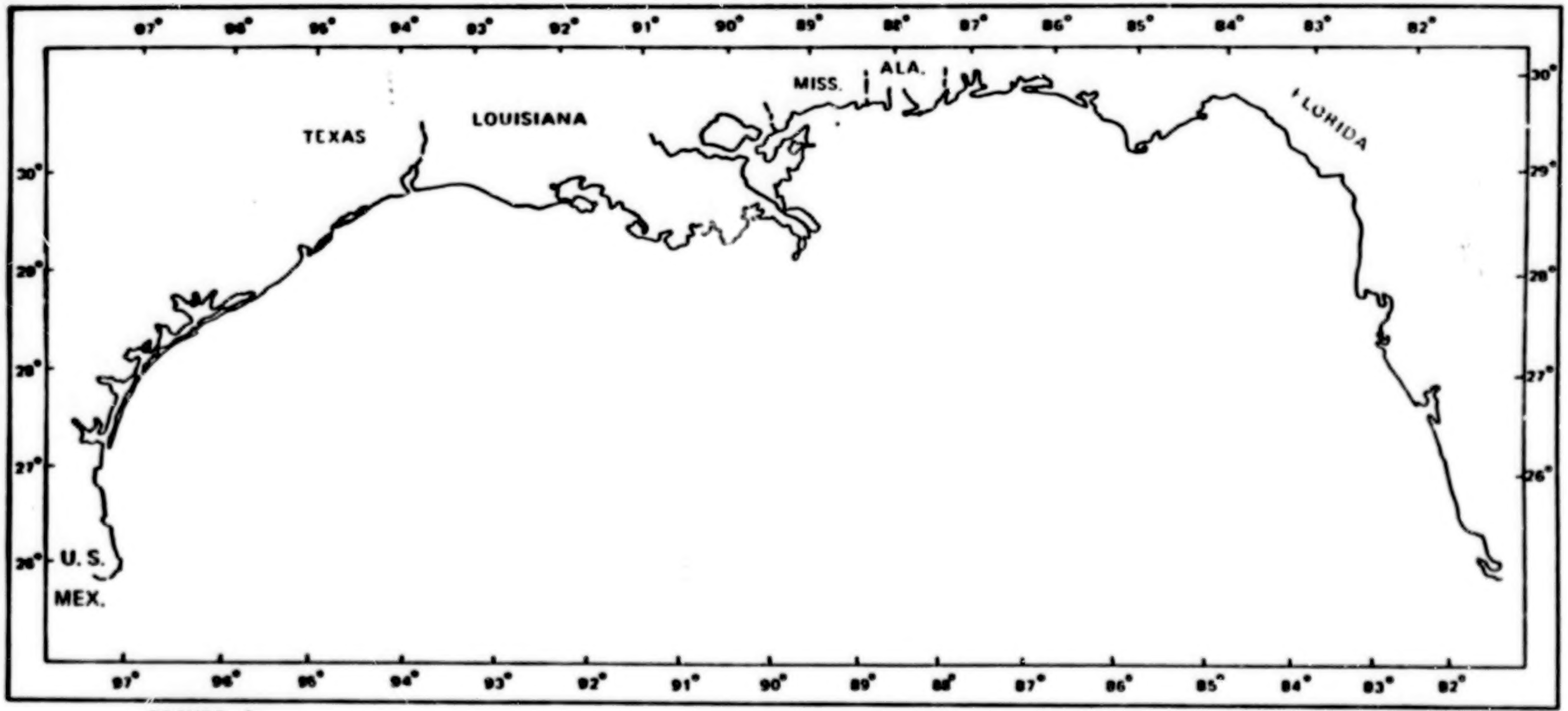

FIGURE A

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SECTION I

DESCRIPTION OF PROPOSED ACTION

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I. DESCRIPTION OF PROPOSED ACTION

A. GENERAL

The granting of permits for conducting G&G activities not authorized under a lease or on lands under lease to a third party on the GOM OCS includes authorization for G&G exploration for mineral resources, G&G scientific research which involves the use of solid or liquid explosives or drilling activities. A definition for these G&G activities as discussed in the context of this EA follows:

"Exploration" means the process of searching for minerals. Exploration activities include but are not limited to: (1) Geophysical surveys where magnetic, gravity, seismic, or other systems are used to detect or imply the presence of minerals, and (2) Any drilling, whether on or off a geological structure.

"Geological exploration for mineral resources" means any operation conducted on the OCS which utilizes geological and geochemical techniques, including, but not limited to, core and test drilling, well logging techniques, and various bottom sampling methods to produce information and data on mineral resources, including information and data in support of possible exploration and development activity. The term does not include scientific research.

"Geophysical exploration for mineral resources" means any operation conducted on the OCS which utilizes geophysical techniques, including, but not limited to gravity, magnetic, and various seismic methods, to produce information and data in support of possible exploration and development activity. The term does not include scientific research.

"Geological or geophysical scientific research" means any investigation conducted on the OCS using solid or liquid explosives, or drilling activities for scientific research purposes involving the gathering and analysis of geological or geophysical information and data which are made available to the public for inspection and reproduction at the earliest practicable time (USDI, GS and BLM, 1981).

Geological and geophysical surveys and analyses provide most of the resource and hazards information used by government and industry on the oil and gas potential of offshore areas. The collecting of G&G data begins prior to the leasing of Federal land and continues throughout the offshore mineral leasing process (USDI, MMS, 1983a).

The number of G&G permits granted on the GOM OCS for the period 1963-1982, was 4,036 for offshore Louisiana, 1,834 for offshore Texas, and 544 for offshore Mississippi, Alabama and Florida (USDI, MMS, 1983b). During 1983, 265, 108, and 41 permits were granted offshore of the respective states (Kazmierczak, 1984, personal communication). An average of six G&G permits involving the use of solid or liquid explosives are granted each year on the GOM OCS (Kuzela, 1984, personal communication). Two deep stratigraphic test wells have been drilled on the GOM OCS, one in South Padre Island Block 1076-L, and the other in Mustang Island Block A-29 (USDI, MMS, 1983a), and no others are currently proposed or anticipated for the near future.

B. EQUIPMENT AND SUPPORT SYSTEMS

This section will be supplemented in an SEA.

1. Geological Exploration Activity

Geological exploration of the OCS consists of bottom sampling, coring, and deep stratigraphic testing. Usually, a program of bottom sampling and shallow coring is conducted simultaneously using a small marine drilling vessel (USDI, GS, 1976a). Bottom sampling utilizes devices which penetrate only a few feet below the ocean bottom to collect samples of sediment. In bottom sampling, a grab, drag, dart, or similar device is used to acquire a small sample of the bottom sediments by either scooping, grabbing, or coring a section of the seafloor.

Grabs are devices which have jaw-like mechanisms for obtaining a sample of the seafloor. They are useful for qualitative studies of sand-sized material. Drags or trawls obtain a sample by means of a wire or line cage which is dragged along the seafloor. Drags can be used on consolidated, semi-consolidated, or unconsolidated bottoms for sample collection. In dart sampling, one of the most commonly used methods of obtaining ocean floor bottom samples, a weighted tube attached to a wire line is dropped over the side of the vessel, strikes the ocean floor, and recovers from a few inches to a few feet of sediment. Some designs depend entirely on weight to penetrate the bottom while others utilize a hammer effect for additional penetration. The sample obtained is useful in identifying the type and origin of the formation. If the formation is sedimentary, the geologic age can be determined by identification of fossils.

Core and test drilling operations are conducted to obtain data on the lithology and geologic age of the sediments, engineering properties, and stratigraphic correlations. Core and test drilling operations are limited to 50 feet (15 meters) of consolidated rock or a total of 300 feet (91.4 meters) into the sea bottom. Box cores are large cross sectional area cores used in the study of the mechanical properties of the sediment. They are forced into the seafloor by impulsive means and are able to obtain samples up to 3 feet (0.9 meters) in length (USDI, GS, 1976b). Shallow coring is performed by conventional rotary drilling equipment from a drilling barge or boat. Penetration is limited usually to the recovery of several feet of consolidated rock. Geological examination of the cores provides useful information on the general geology of an area.

A DST, drilled for the acquisition of geoscientific information, involves penetration into the sea bottom more than 50 feet (15 meters) of consolidated rock or a total of more than 300 feet (91.4 meters). It may go as deep as 16,000 feet (4,877 meters). These locations are determined from the results of seismic and other geophysical surveys. Jack-up or semi-submersible rigs are generally used to drill DST holes (USDI, GS, 1976b). The complete geological section can be determined by electrical logging of the hole and examination of drill cuttings and cores (USDI, GS, 1976a).

Visual survey techniques include television monitors, still photography, and manned submersibles and divers. Visual techniques yield a wide range of information about the sea floor, mineral deposits, and living resources. The concentration and areal extent of surficial deposits can be determined by these techniques. Hazardous features such as boulders, rock outcrops, and other underwater obstacles are readily discernable.

Cameras are commonly used in conjunction with other pieces of survey equipment such as sediment samplers and drills, and to record sampling procedures on film. Television cameras aid in controlling the movement of the drilling vessel. Powerful lamps are used to provide the necessary illumination. Television and motion pictures give a continuous record of seafloor operations during a survey. Video tapes can be used to help distinguish type, concentration, and extent of seafloor deposits.

Still photography yields a detailed picture of the seafloor from which micro-topographic maps can be made. Photographs may be taken at specific intervals so that deposit type, concentration, and extent may be determined. Stereo-paired cameras may be used to produce extremely detailed three-dimensional photographs. Still cameras may be towed or fixed when taking shots, and may be triggered by bottom contact, remote control, or by using a programmed sequence.

Drones, submersibles, and divers allow more direct controlled sampling and observation of the marine environment than other types of surveying. To date, these methods have been in experimental stages and have had limited application in the search for mineral resources. All three types are capable of multiple survey techniques. Manned submersibles and divers are more able to accurately distinguish and obtain representative samples in the marine environment than are the drones. Drones are unmanned instrument packages which may be either tethered to a surface vessel or remain untethered. When tethered, they provide direct communication with the surface vessel but are limited in speed and maneuverability. Submersibles are capable of visual and acoustic surveying, sampling, and geophysical surveying. They are expensive and provide limited duration and speed; however, they offer the advantage of putting a person in direct control at the point of survey. Divers also may carry out survey operations on a limited scale. Surveys of this type are expensive due to the equipment required for deep extended dives.

Geochemical sampling of sea water or bottom sediments along the OCS is another facet of geological exploration. Samples of sea water and sediments are analyzed for anomalous concentrations of certain mobile elements and hydrocarbons (USDI, GS, 1976b).

2. Geophysical Exploration Activity

Geophysical exploration by measuring the velocity of shock, or seismic waves through various rock formations provides additional information at all depths. The shallow information is of value in identifying potentially hazardous conditions such as surface faulting, potential slide areas, or shallow gas pockets. This type of information is also valuable in the choice and approval of drilling locations.

Deep-penetration seismic information is used for regional and detailed mapping. Geophysicists interpret these data by mapping two or more seismic reflections corresponding to the depths of expected hydrocarbon production. These maps show the types of structures such as salt domes, folds, or faults that are most likely to be encountered in the area (USDI, GS, 1976a).

Magnetic surveys are conducted with marine or airborne magnetometers to measure variations in the intensity of the Earth's magnetic field. They are used to detect ferrous objects which could be considered a potential hazard or object of archaeological significance. This information is essential for choosing exploratory drilling and pipeline locations. The principle types of measuring instruments used in OCS surveys are the fluxgate magnetometer, the nuclear magnetometer, and the proton precession magnetometer.

The fluxgate magnetometer was originally developed for airborne use but can also be used aboard ships. This type of magnetometer measures the component of the magnetic field along the axis of its sensor. The nuclear magnetometer is designed to measure total magnetic field intensity by means of the precession of magnetic nuclei, since precession is proportional to field intensity. This instrument can be mounted in aircraft or towed by ship. The proton precession magnetometer is a type of nuclear magnetometer that measures the total intensity of the Earth's magnetic field. The proton precession magnetometer is now widely used aboard research vessels conducting OCS exploration. The most common survey patterns used are grids with five to ten mile (8 to 16km) spacing intervals, depending on the desired accuracy. Closer spaced grid patterns provide for more detailed information.

Gravity surveys, conducted with sensitive instruments called gravimeters, measure components of the Earth's gravitational field. They are used to identify deep-seated geologic structures. The Earth's gravitational field varies depending upon location, and local or regional geologic structure. Most OCS gravity surveys in the past were conducted using an instrument that could be lowered into the water with a cable and electric lines for communication, and allowed to come to rest on the ocean floor. This ocean floor operation is expensive, time consuming, practical only in relatively shallow water, and cannot be conducted simultaneously with most other geophysical operations. OCS gravity surveys are usually conducted using onboard equipment in conjunction with seismic and other geophysical surveys, and in all depths of water.

Bathymetric surveys, basic to marine exploration, are usually performed simultaneously with other surveys. They are the least expensive, easiest, and most rapid of the survey methods. Echo soundings may be carried out by any vessel and may be performed simultaneously with other surveys. A bathymetric survey is made along specified tracks systematically covering the area of interest while continuously recording water depth. The depth to the seafloor is determined by measuring the time for a short acoustic pulse to travel from a ship-mounted transducer to the sea bottom and to be reflected back to the transducer. The time of travel is visually displayed by a graphic recorder. Acoustic power requirements for depth recordings vary with depths and bottom reflectivity. A depth correction is generally applied to soundings in order to compensate for the different sound velocities of sea water in different geographic areas. The returning signal intensity will also yield data indicating the composition and configuration of the seafloor. Bathymetric maps prepared from these soundings show depth contours (isobaths) and undersea topographic features and also provide information for hazards analysis.

Seismic surveys conducted by surface craft gather data which enable geophysicists to map the configuration and depth of subsurface geologic formations. This is done by measuring the travel time required for an artificially generated seismic (acoustic) wave to travel into the subsurface and return after being reflected or refracted by either unconsolidated sediments or rock layers below the sea floor. In marine seismic exploration, a ship travels along a predetermined course, towing signal generating and recording equipment. The signal generated by the energy source is a series of small amplitude acoustic energy pulses that travel at thousands of feet per second through the water and sediments below. An array of sensitive hydrophones towed by the vessel detects incoming seismic waves, and the travel times are recorded on magnetic tape. After extensive processing, these recordings are displayed in the form of vertical cross sections. These seismic profiles are interpreted to identify those areas where the sediments are arched, faulted, or intruded by salt domes. Sediment thickness and the occurrence of reef structures within the sediments can be interpreted. By assembling cross sections in various directions, a three-dimensional picture can be constructed, indicating location, size, and form of geologic structures favorable for oil and gas accumulation. This information is normally displayed in the form of a series of subsurface seismic structure maps. In addition to deep penetration common depth point (CDP) seismic reflection data, shallow penetration high resolution seismic data are used to locate potential geologic hazards such as unstable bottom conditions.

Most seismic surveying utilizes electric sparkers and air guns as an energy source. Because of the hazards associated with the use of explosives, other methods to create an energy source are used and account for well over 95 percent of marine seismic activity. A sparker system and high resolution profiler is used to acquire shallow subbottom structural and sedimentary information, and to display this information in analog profile or cross section form on a graphic recorder. Digital processing of sparker data is sometimes used to enhance seismic data quality. Sparker surveys are conducted in the same manner as the seismic surveys, using a towed electric spark energy source and a hydrophone array, both towed from a ship. Reflection data are acquired using various combinations of acoustic power outputs and frequencies depending on the depth of bottom penetration and the degree of resolution desired.

Subbottom profilers gather data by transmitting high powered pulses of acoustic energy into the water column which is reflected by the seafloor and subbottom bedding layers. They provide information such as sedimentation and biogenic gas accumulations. Side-scan sonar is a high-resolution geophysical system used to distinguish the topography of the seafloor and is used to identify hard bottoms and potential cultural resources. The system employs a stable torpedo-shaped transducer which is usually towed at the side or astern of a vessel on 150, 500, or 2,000 foot (45, 150, or 600 meter) cables, with normal operating depths to 1,200 feet (365 meters). A pulsing acoustic beam is emitted from the "tow fish." The beam shape and very short length of the acoustic pulse gives the side-scan sonar the capability to resolve small topographic irregularities and small objects on the sea floor. By comparing the intensity and shape of the recorded echoes, the side-scan system can differentiate between sand, mud, rock outcrops, shell beds, coral, and other materials (USDI, GS, 1976b).

C. SCHEDULE OF ACTIVITIES

The expected schedule of activities will be addressed in an SEA.

D. TRANSPORTATION ROUTES

This section will be addressed in an SEA.

E. PERSONNEL REQUIREMENTS

The types and numbers of personnel that would typically support G&G operations include seismic vessel, DST drilling, and crew, tug and supply boat personnel, and are presented in Tables I-1, I-2, and I-3, respectively of this EA. Approximately 140 employees can be involved in an exploratory drilling operation when consideration is given to onshore, transportation, and offshore work requirements (CSA, 1984).

Supplemental information will be addressed in an SEA (if applicable).

F. TECHNOLOGY

Refer to Section I.B.1 and I.B.2 of this EA. Any new or unusual technology employed in the proposal will be addressed in an SEA.

G. CONTINGENCY PLANS

The applicant for a G&G permit is responsible for adhering to all Federal laws and regulations governing disposal of wastes. For DST applications, information on safety features, pollution prevention and control features, including oil spill containment and cleanup plans and onshore disposal procedures must be submitted to the Minerals Management Service (MMS) for approval.

Supplemental information will be addressed in an SEA.

H. DISCHARGES AND EMISSIONS

1. General

Solid and liquid discharges and gaseous emissions would be generated by offshore and onshore activities and transportation operations.

2. Solid Wastes

This section is addressed in Section IV.A.4 of this EA.

3. Liquid Wastes

This section is addressed in Section IV.A.4 of this EA.

4. Gaseous Wastes

This section is addressed in Section IV.A.5 of this EA.

I. STATE CERTIFICATION

The GOM coastal states are not involved in the review process for G&G applications prior to issuance of the permit, except for DSTs. Supplemental information will be addressed in an SEA.

J. MEASURES FOR COMPLIANCE

Geophysical surveys must be in compliance with the MMS notices to Lessees on cultural resources requirements, 75-3 (Revision No. 1), and shallow hazards requirements, 83-3. Additional measures for compliance, over and above those required by applicable regulations, and requirements for G&G applications, will be addressed in an SEA.

TABLE I-1

COMPREHENSIVE LISTING OF JOB TYPES FOUND ON AN EXPLORATORY SEISMIC VESSEL[1]

Job Type
Computer Chief, Seismograph
Computer, Electrical Prospecting
Computer, Seismograph
Core Analyst
Electrical-Prospecting Engineer
Electrical Prospector
Geologist, Petroleum
Gravity-Meter Observer
Gravity Prospector
Manager, Field Party, Geophysical Prospecting
Observer, Electrical Prospecting
Observer Helper, Gravity Prospecting
Observer Helper, Seismic Prospecting
Observer, Seismic Prospecting
Section-Plotter Operator I
Shooter, Seismograph
Surveyor, Geophysical Prospecting

[1] Does not include personnel who are involved with the operation and maintenance of vessel. There is one crew per vessel. There is usually one of each type present.

Source: University of New Orleans, 1976.

TABLE I-2

LISTING OF PERSONNEL FOR A DEEP STRATIGRAPHIC TEST DRILLING OPERATION[1]

	Job Type
1	Foreman
1	Senior Tool Pusher
1	Tool Pusher
2	Drillers
2	Assistant Drillers
2	Derrickmen
6	Floormen
2	Motormen
2	Crane Operators/Roustabout Foremen
8	Roustabouts
2	Mechanics
3	Electricians
1	Welder
1	Senior Mechanic/Electrician
2	Mud Mixers
2	Painters
2	Storekeepers
1	Rig Safety and Training Representative
1	Barge Operator
2	Watchmen
2	Cooks
3	Cooks' Helpers
1	Cementing Engineer
1	Mud Engineer
51	Total

[1] The employees normally work on a 7-days-on/7-days-off work schedule. Other personnel such as casing crews, electric loggers and engineers are flown in on an as-needed basis. Staff employees are temporarily assigned to the onshore base of operations.

Source: USDI, MMS, 1984b.

TABLE I-3

LISTING OF VESSEL EMPLOYMENT FOR A DEEP STRATIGRAPHIC TEST DRILLING OPERATION[1]

Job Type	Tugboats		Crew Boats		Supply Boats	
	[2]	[3]	[2]	[3]	[2]	[3]
Captain (Master)	1	1	1	1	1	1
Mate	0	0	1	0	2	0
Engineer	1	0	1	0	1	0
Assistant Engineer	0	0	0	0	1	0
Able Seaman	0	0	0	0	1	0
Cook	0	0	1	0	1	0
Deckhand	2	1	2	1	2	1

[1] If vessel operates for more than 12 hours per day, two captains are required; otherwise, one crew per boat.

[2] Length greater than 100 feet.

[3] Length less than 100 feet.

Source: University of New Orleans, 1976.

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SECTION II

ALTERNATIVES TO PROPOSED ACTION

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II. ALTERNATIVES TO PROPOSED ACTION

This section will be addressed in an SEA.

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SECTION III

DESCRIPTION OF AFFECTED ENVIRONMENT

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III. DESCRIPTION OF AFFECTED ENVIRONMENT

A. PHYSICAL ENVIRONMENT

1. Environmental Geology and Hazards

a. General Description of Geology

The continental margin within the GOM Region is composed of two parts. The continental shelf is an extensive plain sloping less than one degree seaward and having low relief due to wave and current action and the effects of sedimentation. The continental slope is a relatively steep geomorphic feature that can range from two to forty-five degrees in the GOM Region. The shelf was exposed to subaerial conditions several times during the Pleistocene epoch, as well as to various constructional and depositional processes. As the sea level transgressed and regressed across the shelf, a series of wave-cut terraces were formed that are easily distinguishable.

Physiographically, the northern GOM is divided into nine distinct provinces: the West Florida Shelf, the West Florida Terrace, the South Florida Slope, the West Florida Slope and Escarpment, the Mississippi-Alabama Shelf, the DeSoto Slope, the Upper Mississippi Fan, the Texas-Louisiana Shelf, and the Texas-Louisiana Slope and Plateau (USDI, MMS, 1983c). Visual No. 9 of the Draft Environmental Impact Statement (draft EIS) for Sales 94, 98, and 102 depicts the submarine physiography of the GOM (USDI, MMS, 1984a).

b. Potential Geologic Hazards

Several primary factors lead to unstable and hazardous conditions on the GOM seafloor: 1) increase in the topographic gradient at the edge of the continental shelf where it merges with the continental slope; 2) isostatic adjustments and deep-seated gravity faulting; 3) high rates of sedimentation; 4) diapirism; 5) high gas content in rapidly deposited sediments; 6) karst features on the West Florida Platform; and 7) water depths greater than 400m (USDI, MMS, 1983d).

c. Petroleum Geology

The GOM continental shelf possesses characteristics conducive to hydrocarbon development and entrapment. Portions of the continental slope are considered to have high potential for the accumulation of hydrocarbons.

2. Meteorological Conditions

a. Temperature

The average temperature over the center of the Gulf is about 29°C in the summer; winter temperatures average between 17-23°C.

b. Cloudiness and Visibility

Fog results from warm, moist Gulf air blowing slowly over chilled land or water surfaces. Fog occurrence decreases seaward but visibility has been less than 1/2 mile due to offshore fog. Coastal fog generally lasts three or four hours, although particularly dense sea fogs may persist for several days. Poorest visibility conditions occur during winter and early spring. The period from November-April has the highest frequencies of low visibilities.

c. Wind

Winds are more variable near the coast than over open waters because coastal winds are more directly influenced by the moving cyclonic storms that are characteristic of the continent and because of the sea and land breeze regime. The Azores-Bermuda atmospheric high pressure cell dominates circulation over the Gulf, particularly during the spring and summer months. In late summer there is a general northward shift of the circulation, and the Gulf becomes more directly influenced by the equatorial low pressure cell. During the relatively constant summer conditions, the southerly positions of the Azores-Bermuda cell generates predominantly southeasterly winds which become more southerly in the northern Gulf. Winter winds usually blow from easterly directions with fewer southerlies but more northerlies. Winds from the west and southwest are rare at anytime during the year.

d. Precipitation

Average annual precipitation along the Gulf coast ranges between approximately 69cm at Brownsville, Texas; 102cm at Galveston, Texas; and 137cm at New Orleans, Louisiana, and Fort Myers, Florida. Rainfall is fairly evenly distributed throughout the year, with the greatest amounts occurring during June, July, and August when the winds are predominantly out of the south and southeast.

e. Severe Weather

The most destructive severe storms are hurricanes which occur principally during the late summer and early fall. Hurricanes vary considerably in intensity, track patterns, and behavior when crossing lands.

3. Physical Oceanography

a. Sea Temperature and Salinity

In the eastern Gulf maximum surface temperatures range from 27°C in late winter to about 30°C in the summer. A range of 22-29°C is observed in the Western Gulf, the difference reflecting the contribution of the Loop Current. Lowest values encountered may range as low as approximately 10°C in the Louisiana-Mississippi shelf region owing to extraordinary snow melt in the upper Mississippi valley. Salinity extremes and concentrations in the GOM by depth ranges are listed in Table III-1 of the Final Regional Environmental Impact Statement (final REIS) for Sales 72, 74, and 79 (USDI, MMS, 1983d).

b. Currents

The GOM is a semiclosed system with oceanic input through the Yucatan Channel and principal outflow through the Straits of Florida. Runoff from approximately two-thirds of the area of the United States and more than half the area of Mexico empties into the Gulf. This large amount of runoff with its nonoceanic composition is mixed into the the surface water of the western Gulf and makes the chemistry of parts of this system quite different from the open ocean. The Loop Current is the strongest influence on circulation in the open Gulf. Additionally, it often influences local circulation in shelf areas where it impinges on the shelf or where an eddy may form and travel.

c. Tides and Sea State

Gulf of Mexico tides are small and noticeably less developed than many other coastal areas of the Atlantic or Pacific states. The ranges of tides throughout the Gulf are typically on the order of 0.3-1.2 meters depending on the location and time of year. The type of tide differs considerably throughout the Gulf. In some locations the tide is of a diurnal nature while in others it may be semidiurnal or both.

4. Water Quality

Water quality is based upon numerous factors, including currents, freshwater inputs, nature and number of discharges, outfalls, and human activities that consist of municipal and industrial waste discharges, runoff, oil spillage, dredging, etc. In the past, water quality has been defined as the degree to which chemical concentrations and physical parameters within a water mass approach the ambient water state. Offshore water quality degradation in the GOM is associated primarily with effluent discharges by current offshore enterprises, consisting of OCS activities and marine transportation sources. Coastal or onshore water quality varies and is determined by river outflows into the Gulf, primarily the Mississippi River. Refer to Section III.C.10 of the final REIS (USDI, MMS, 1983d) for detailed information on water quality of the GOM.

5. Air Quality

The air quality of the coastal area along the GOM varies considerably by local area; however, even with some violation of the National Ambient Air Quality Standards (NAAQS), it is generally considered to be good and in many areas is better than the Standards. Refer to Section III.C.11 of the final REIS (USDI, MMS, 1983d) for further discussions of air quality in the affected environment.

A more detailed description of the physical environment of the GOM is found in Section III.A of the final REIS (USDI, MMS, 1983d).

B. BIOLOGICAL ENVIRONMENT

1. Coastal Habitats

The following habitat types are characteristic of the Gulf coast: seagrass beds, mangroves, non-forested wetlands (tidal marshes), and forested wetlands (bottomland hardwoods, cypress-tupelogum swamps, and tropical hardwood hummocks). Refer to Section III.B.1 of the final REIS (USDI, MMS, 1983d) for a detailed discussion of coastal protected areas of biological concern.

2. Offshore Habitats

a. Pelagic Environment

The pelagic environment consists of phytoplankton, zooplankton, and nekton. Refer to Section III.B.2 of the final REIS (USDI, MMS, 1983d) for a detailed discussion of the pelagic environment of the GOM.

b. Benthic Environment

Benthic fauna include the infauna (animals which live in the substrate such as burrowing worms and molluscs) and epifauna (animals that live on the substrate such as molluscs, crustaceans, hydroids, sponges, and echinoderms). Shrimp and demersal fish are closely associated with the benthic community (USDI, MMS, 1983d).

c. Sensitive Underwater Features

The sensitive underwater features of the GOM including hard/live bottom areas, seagrasses, and topographic highs are discussed in detail in the draft EIS (USDI, MMS, 1984a). Specific sensitive underwater features located within the area of a proposed activity will be discused in an SEA.

3. Endangered or Threatened Species

A number of Federally designated endangered and threatened species of animals occur, either on a permanent or on a transitional basis within the GOM. Detailed information on endangered and threatened species is found in the biological opinion, Appendix Section of this EA, and Section III.B.3 of the draft EIS (USDI, MMS, 1984a).

4. Breeding Habitats and Migration Routes

The GOM coastal wetlands are the overwintering site for about 4-8 million migratory waterfowl. About 27 species of marine mammals have been reported to occur in or migrate through the Gulf region.

5. Protected Areas of Biological Concern

The coastal and offshore habitats in the GOM provide an intricate network of environmental systems which have resulted in diverse management schemes to maximize utilization without endangering the resources. Refer to Sections III.B.1 and III.B.2 of the final REIS (USDI, MMS, 1983d) for a detailed discussion of coastal and offshore protected areas of biological concern.

C. SOCIOECONOMIC CONDITIONS AND CONCERNS

1. Economic and Demographic Conditions

The socioeconomic impact area comprises 74 counties and parishes. The coastal counties/parishes extend from Dade County in southeast Florida to Cameron County in southernmost Texas.

a. Related Employment and Unemployment

The highest levels of employment by major industry group in each states's coastal region are in the areas of manufacturing, wholesale/retail trade, and services (including finance, insurance, and real estate).

Standard Industrial Classification (SIC) codes can be used to identify the numbers and distribution of employment involved in G&G exploration activities in the GOM socioeconomic impact area. SIC code 131 (Crude Petroleum and Natural Gas) employees employed by companies which do their own exploratory work. SIC code 1382 (Oil and Gas Field Exploration Services) employees are engaged in geophysical, geological and other exploration work for a contract, fee, or other basis (University of New Orleans, 1976). Table III-1 gives the approximate levels of employment by State for 1980. A distinct category for offshore employment figures was not included.

Table III-1 indicates that 69% of the G&G exploration employment occurs in Texas, 27% in Louisiana, 3% in Mississippi, and less than one percent in Alabama and Florida. When a range for the employment data was given, the midpoint was used. The majority (78%) of G&G employment is found within oil and gas companies which do their own exploratory work. Refer to Section III.C.1.c of this EA for a discussion of the size and location of G&G exploration industry.

b. Location and Size of Related Population Centers

Population growth in the Gulf region has experienced growth rates well above the national level since 1970.

c. Location and Size of Related Industry Centers

The infrastructure for oil and gas industry in the GOM is the most developed in the world. It includes oil refineries, petrochemical and gas processing plants, supply bases for offshore services, platform construction yards, pipeline yards, and other industry-related installations. This infrastructure is highly concentrated in the coastal areas of Louisiana and eastern Texas and to a lesser extent along the southern half of the Texas gulf coast. To the east, the infrastructure is found as far as Mobile, Alabama.

Primary industries have been defined as those activities typically conducted by industry and their vendors in order to discover, produce, and bring crude oil and gas to processing locations. This includes exploration, drilling, mud service, other oil and gas field services, and water transportation (University of New Orleans, 1976). G&G exploration activities in this socioeconomic impact area would be considered within this primary industrial classification.

SIC codes are used in Table III-1 to identify the location and size of related industry centers for the GOM area for 1980. A distinct category for offshore industry figures was not included. Refer to Section III.C.1.a. of this EA for the SIC code definitions and discussion on G&G employment.

Table III-1 indicates that 78% of the G&G industrial establishments occur in Texas, 16% in Louisiana, 4% in Mississippi, 1% in Florida, and less than one percent in Alabama. The majority of the industrial establishments (76%) involved in G&G exploration activities are those which do their own exploratory work as opposed to contracting the work out for a fee or other basis.

A more detailed discussion of employment, and the location and size of population and industry in the GOM can be found in Sections III.C.1, III.C.3, and III.C.6, respectively of the draft EIS (USDI, MMS, 1984a).

2. Land Use

The coastal areas in the Gulf consist primarily of barrier island formations, beaches, and wetlands. There are approximately 9,000 miles of state shorelines. Of these, 960 miles are barrier islands; 3,100 miles are wetlands; 2,500 miles are beachfront, which alone represents 28% of the total; and private ownership predominates. Federal ownership is extremely limited, except for concentrations in the Florida Panhandle. Nonfederal public (state/local) ownership is greatest in Louisiana where the state owns several wildlife/conservation management areas. Agricultural and undeveloped open spaces (parks, forests, etc.) are the predominant land and water uses; however, the metropolitan and urban areas dominate the region from an economic and social standpoint, with three-fourth's of the total coastal population residing in these areas (USDI, MMS, 1984a).

a. Existing Community Services

A comprehensive listing of the types of services and materials that would typically support offshore G&G exploratory operations is presented in Table III-2.

b. Existing Transportation Systems and Facilities

Refer to Section III.C.5 of this EA for a discussion relative to existing transportation systems. Site-specific information will be addressed in an SEA.

c. Supply and/or Existence of Coastal Resources

Site-specific information will be addressed in an SEA.

TABLE III-1

GEOLOGICAL AND GEOPHYSICAL EXPLORATION EMPLOYMENT AND INDUSTRY[1], GOM SOCIOECONOMIC IMPACT AREA

State	Number of Employees SIC Code 1382	SIC Code 131	Totals	Number of Establishments SIC Code 1382	SIC Code 131	Totals
Texas	13,107	44,598	57,705	670	2,305	2,975
Louisiana	4,429	18,714	23,143	172	451	623
Mississippi	758	1,750	2,508	54	110	164
Alabama	207	254	461	13	19	32
Florida	120	175	295	12	31	43
TOTAL	18,621	65,491	84,112	921	2,916	3,837

[1] Standard Industrial Classification (SIC) Codes 1382, Oil and Gas Field Exploration Services and SIC Code 131, Crude Petroleum and Natural Gas data used (1980).

Source: USDC, BC, 1982.

TABLE III-2

SERVICES AND MATERIALS IN SUPPORT OF A TYPICAL G&G EXPLORATION ACTIVITY

Local	Specialized
Port Facilities	Rig Contract
Helicopters (possible)	Cargo Boats
Communications - Parts and Services - Radio, Telecopter, Telephone, etc.	Cementing Services
Diving Service	Electrical Logging Services
Machine Shop	Catering Services
Welding Service	Casing Driving and Running Service
Labor Contractor with Material Handling Equipment	Perforating Service
Contract Oilfield or Specialty Trucking Firms	Fishing Tools
Air Service Companies (Regular & Charter)	Directional Drilling Service
Medical Services - at Marine and Helicopter Bases	Coring Equipment and Services
Diesel Engine Repair Firms	Mud Engineering
Motor Freight	Logging Service
Specialized Carriers including Bus, Courier Service, etc.	Completion Equipment and Services
Weather Service	Tubular Inspection Firm - Full Service Electronic Pressure Test, etc.
Small Fabricators	Wellhead Equipment and Service
Electrical Equipment Repair Shop	
Laundry Service	
Bilge Waste Disposal Service	
Garbage, Trash Dump Service	
Security Service	
Magnetic Particle and X-ray Service	
Rental Car Agency	
Motels/Restaurants Near Port	
Propeller Repair Firm	
Tug Service	

Source: CSA, 1984.

3. Onshore Support Facilities

Oil and gas industry infrastructure (including ports, shipyards, and supply bases) is highly concentrated within the coastal parishes/counties of the GOM assessment area. Refer to Section III.C.6 of the draft EIS (USDI, MMS, 1984a) for a detailed discussion of oil and gas industry infrastructure. The majority of support for G&G exploration activity would be for vessels utilizing existing port facilities in the GOM. A typical onshore base which would support an offshore DST drilling operation is illustrated on Figure III. The base normally includes dock, office and warehouse space, a mobile crane, storage tanks, heliport, parking area, and road access.

Site-specific information applicable to onshore support facilities will be addressed in an SEA.

4. Public Opinion

On February 9, 1979, the Department of the Interior published a proposed revision of 30 CFR Part 251 (44 FR 8302) which described new procedures, and to the extent required by the OCS Lands Act, modification to existing practices and procedures that govern prelease G&G explorations of the OCS. A total of 39 parties commented including two private citizens, three environmental organizations, eight state and local governments, and 26 oil and gas and trade organizations. A hearing was also held in Washington, D.C. on May 8, 1979 (USDI, GS and BLM, 1981).

5. Navigation

Many shipping fairways and anchorage areas are found in this GOM assessment area. These fairways connect the major Gulf ports, which include the deepwater oil terminal located offshore Louisiana. Regulations prohibit the placement of fixed structures in fairways, thus providing clear passages of 2 nmi in width through the developed areas of the Gulf. Vessels operating along the coast generally use the Gulf Intracoastal Waterways which follow the coastline inshore and through bays and estuaries from Fort Myers, Florida, to Brownsville, Texas. G&G vessel traffic will utilize this extensive transportation system.

6. Military Warning/Use Areas

The air space over the GOM is used extensively by the Department of Defense (DOD) for conducting various air-to-air and air-to-surface mission operations. A series of nine military warning areas and five water test areas are located within the Gulf. These warning and water test areas are multiple use areas, wherein military operations and oil and gas development have coexisted without conflict for many years. For the location of these military warning status areas, see Visual No. 11 of the draft EIS (USDI, MMS, 1984a).

7. Commercial Fishing

The GOM is an important fisheries production area with total annual landings averaging about two billion pounds, valued at over $500 million dockside. The Gulf shrimp fishery represents the single most valuable fishery.

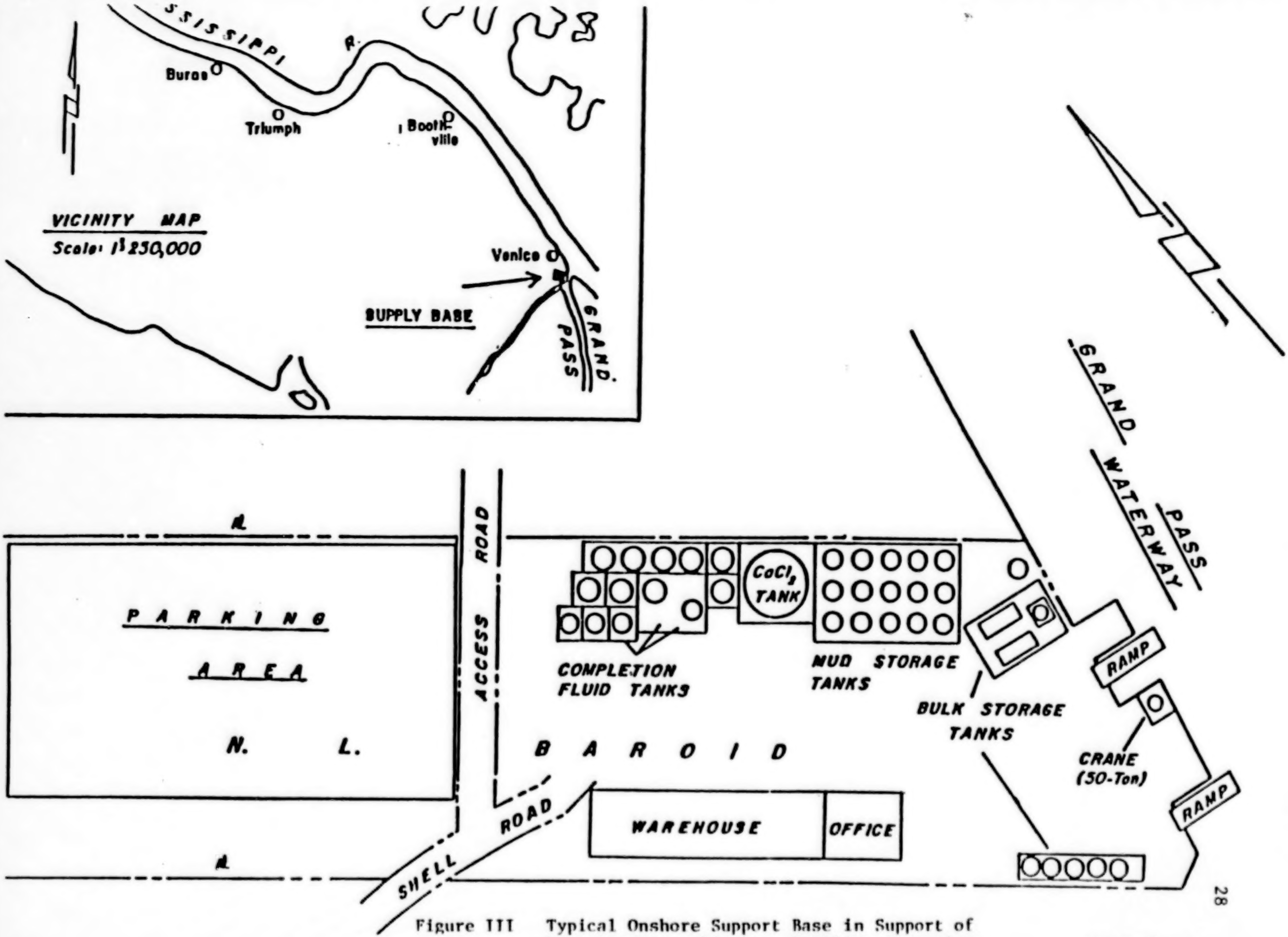

Figure III Typical Onshore Support Base in Support of Deep Stratigraphic Test Drilling Operations

Source: Phillips Petroleum Company, 1984

The menhaden purse seine fishery is the most important fishery in terms of pounds landed. About 50 species of finfish contribute to the total Gulf food finfish landings that average about 112.5 million lbs/yr, oyster landings approximate 15 million lbs/yr, and about 40 million lbs of blue crabs are landed annually.

8. Recreation

The northern GOM coastal zone is one of the major recreational regions of the United States, particularly in connection with marine fishing and beach-related activities. The shorefronts along the Gulf coasts of Florida, Alabama, Mississippi, Louisiana, and Texas offer a diversity of natural and developed landscapes and seascapes.

9. Cultural Resources

Cultural resources are any objects or features which are man-made or modified by human activity. Significant cultural resources are either historic or prehistoric as defined by 36 CFR 60.6. Refer to Section III.C.12 of the draft EIS (USDI, MMS, 1984a) for a detailed discussion of historic and prehistoric cultural resources in the GOM assessment area.

10. Other Commercial Uses

There are no other known commercial uses in the area.

11. Other Mineral Uses

The Secretary of the Interior is authorized under the OCS Lands Act, 43 U.S.C. 1331 et seq., to issue leases for minerals other than oil, gas, and sulfur on the OCS, and under the provisions of the Mining and Minerals Policy Act of 1970, 30 U.S.C. 21a, to foster and encourage private enterprise in mining or mineral activities.

A variety of mineral commodities occurs as surficial or near surficial deposits on the OCS. Deposits of sand in Federal and State waters off the coasts of Mississippi and Alabama are of interest because of their use in the production of glass. Sulphur and salt deposits associated with the thousands of diapiric and domed structures on the OCS seafloor have mining potential. There are no manganese nodule deposits in the GOM, and the extent, quantity, and quality of phosphate deposits on the Florida platform are not fully known.

In order for development to proceed, impact assessment of the proposed oil and gas leasing program on future mineral OCS mining is dependent upon many prerequisites, the most important of which are discovery and evaluation followed by technological advances and a supportive economic climate. At present, there are no further plans or proposals for the mining of minerals from the GOM OCS seafloor. This activity is in the distant future until the above-mentioned prerequisites are conducive to offshore mining (USDI, MMS, 1984b).

12. Pipelines and Cables

There are two categories of OCS pipelines, rental and nonrental lines. Rental lines are regulated under 30 CFR 256 Subpart N. Nonrental lines are regulated under 30 CFR 250.20. Refer to the Region Environmental Assessment, GOM Pipeline Activities (USDI, MMS, 1983e) for a detailed discussion of pipelines in the GOM assessment area.

13. Ocean Dumping

All ocean dumping is regulated by the Marine Protection, Research, and Sanctuaries Act of 1972, 33 U.S.C. 1401 et seq. These regulations require a U.S. Environmental Protection Agency (USEPA) permit for all ocean dumping of industrial wastes and municipal sludge materials. Ocean dumping of sewage sludge is prohibited. The designated ocean areas where wastes may be disposed are listed in 40 CFR 228. Further, USEPA publishes an annual report entitled Ocean Dumping in the United States. This report includes information on permit holders, type of waste approved for disposal under the permit, and yearly waste volumes disposed.

USEPA has designated one large deepwater disposal area in the western GOM. There are no present or expected ocean dumping grounds designated in the eastern Gulf (USDI, MMS, 1984b).

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SECTION IV

ENVIRONMENTAL CONSEQUENCES

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IV. ENVIRONMENTAL CONSEQUENCES

A. IMPACTS CONCERNING THE PHYSICAL ENVIRONMENT

1. Impacts Concerning Geology

Seafloor instabilities present limitations and may necessitate adaptations in the siting and structural engineering of the drilling rigs used for DST holes. G&G activities for mineral exploration or scientific research activities authorized under 30 CFR Part 251 must be conducted so that the activities permitted do not create hazardous or unsafe conditions. G&G activities provide data on potential geologic and man-made hazards. Geophysical surveys must be in compliance with the MMS Notice to Lessees 83-3, Shallow Hazards Requirements for the GOM OCS Region. DST drilling must be accomplished with the best available and safest technology.

The area of the sea bottom disturbed during sediment sampling will be dependent upon the type of sampling devices used. Coring devices take a sample 25 to 30 centimeters in diameter and a few yards long. Grab samplers take a sample a few square meters or less and penetrate the bottom to several centimeters below the seafloor (USDI, BLM, 1973). Drags and trawls range in size from 4 to 20 feet (1 to 6 meters) across the mouth, cover much larger areas, and obtain a sample by skimming off the top layer of nodules or sediment. A trawl or sample dredge will generally be limited to scraping the surface in which case only the top few centimeters of the bottom will be disturbed. In all cases the area of the seafloor that is affected is very small (USDI, GS, 1976b). The placing of explosive charges on the seafloor is prohibited in the GOM.

Supplemental site-specific information will be addressed in an SEA (if applicable).

2. Impacts Concerning Meteorology

Several weather factors could affect some phase of G&G operations. First, hazardous conditions and damage to facilities could be expected at least once each year during hurricanes. Second, severe winter storms may cause delays in the operation but should not cause structural damage as these storms are short-lived (24-36 hours) and do not have time to build up a destructive ocean wave. Third, in the winter months, dense fog may hamper navigation and thus interfere with geophysical, service, or supply vessel traffic for several days. There is little evidence that any offshore operations would significantly affect or be affected by the general meteorological conditions in this area (USDI, MMS, 1984b).

3. Impacts Concerning Physical Oceanography

G&G activities in the GOM are not expected to have any effect on the physical parameters (currents, tides, and wave activity) of the environment. Regulated discharges and other G&G activity are not expected to have an effect on sea temperature or salinity other than a very localized effect near discharge outlets where the dispersion and diffusion processes begin (USDI, MMS, 1984b). Turbulence at the surface from explosives would be minimal and of short duration. Heating of sea water at the detonation point would be brief, and any chemical residues from the explosives would be dispersed rapidly (USDI, GS, 1981).

Oceanographic conditions such as high velocity currents, large waves, storm surges, etc., could adversely affect G&G activities. Although mechnical equipment and operations procedures are designed to cope with extreme environmental conditions, it is not common practice to design for maximum conditions that could be encountered in the working area but rather to some maximum expected condition over the life of the structure or operation, i.e., a 25-year wave, 30-year storm, etc. Thus, it is possible during the lifetime of a structure (even during a short-term DST or other G&G activity) that the design limits of the equipment may be exceeded, or mechnical degradation and/or minor failures may progress to the point that physical conditions less than the design limits could result in major failure (USDI, MMS, 1984b).

4. Impacts on Water Quality

The natural condition of sea water may be altered and degraded in several ways during G&G exploration activities. Solid and liquid discharges would be generated by offshore and transportation operations.

During drilling operations, drill cuttings are sometimes discharged through shunt lines to the seafloor (USDI, GS, 1976b). The rates of discharge vary from about 1 to 10 bbl/h^{6}. The higher number is more characteristic of the shallow part of the hole when drilling is fast and the diameter large. Over the life of the well, 3,000 to 6,000 bbls of wet solids are discharged. Intermittent bulk discharges occur ranging from 100 to 1,000 bbls per discharge. About 1,000m^{3} (2,000 tons) of dry solids are discharged both in bulk and from solids control equipment over the life of a typical exploratory well (NRC, 1983). The quantity of discharged cuttings depends upon the type of hole being drilled. With core holes, the entire core is saved for analysis and only the peripheral cuttings from the core bit are discharged. Rotary drilled holes are frequently sampled at 5 or 10 foot (1.5 to 3.1 meters) intervals, depending upon the formation being penetrated, with a sample drawn for each participant. In both core and rotary drilling, the cuttings are separated from the drilling mud and washed prior to sampling and discharge. Most of the drill cuttings consist of sand and shale which settle rapidly causing minor turbidity (USDI, GS, 1976b).

Impacts resulting from resuspension of bottom sediments during shallow and DSTs may include increased water turbidities and mobilization of sediments containing highly concentrated pollutants in the water column. The magnitude and extent of any turbidity increases would depend on the hydrographic parameters of the area, duration of the activity, and bottom material composition. The toxic effects of some of these pollutants could be long lasting in confined areas, depending on the quantities disturbed, local hydrographic effects, and the biota of the immediate area (USDI, MMS, 1984b). Bottom sampling will increase the turbidity of the water in the immediate area of operations. Little formation water is brought to the surface during core and rotary drilling operations. One purpose for using drilling mud is to prevent influx of formation waters into the drill hole. The small quantities of water that may enter the hole would mix with the drilling mud and would remain within the mud system (USDI, GS, 1976b).

Debris and bilge water may be released into OCS waters from geophysical vessels, crew boats, tugs, and service and supply boats used during G&G

exploration operations. No estimate can be made of the quantities involved but they should be similar to amounts released by other types of oil and gas industry vessels. The major solid waste impacts from the use of seismic vessels are accidental spills or leakage of fuel oil and lubricants. Garbage and sanitary waste would also be produced on those vessels with crew quarters and are usually disposed of onshore at an approved site (COE, 1984).

Treatment of liquid waste effluents from the DST site must be in compliance with the National Pollutant Discharge Elimination System (NPDES) permit. The following typical discharges could be expected: 1,750 gal/day of sanitary wastes, 2,500-4,000 gal/day of domestic wastes, 7,200 gal/day of water from the freshwater maker blowdown, two 55 gallon drums of oil per month from the deck drains, 4,000 gal/day of seawater ballast, and 1,000 gallons during a weekly blowout preventer test (USDI, MMS, 1984c). The discharge of treated sanitary and domestic wastes from the various facilities regulated by NPDES permits will increase levels of suspended solids, nutrients, and chlorine in a small area near the point of discharge. Some residual chlorine may be present in discharged waters following treatment; however, due to evaporation and conversion to other chemical forms when combined with seawater, it is quickly diluted (USDI, MMS, 1984b).

Lubricating oils and fuels used on the drill rigs could be accidentally spilled leading to possible water degradation. Accidents involving crew boats, geophysical ships, supply boats, and similar craft could also lead to accidental oil spills. Part of this spilled oil would be removed by clean-up operations and some would evaporate, but the largest proportion would probably be dispersed into the OCS waters (USDI, GS, 1976b). Refer to Section IV.B of the draft EIS (USDI, MMS, 1984a) for a discussion of oil spill impacts. Any site-specific informaiton will be adressed in an SEA.

5. Impacts on Air Quality

Gaseous emissions would be generated by transportation, offshore, and onshore operations. The quality of air over the OCS where G&G exploration activities are conducted could be degraded by exhaust emissions of stationary power units, aircraft, and geophysical vessels. Exhaust emissions are expected to have only a minor impact on the air quality. Marine and helicopter traffic operating out of established bases is not expected to contribute to significant degradation of onshore air quality. Refer to Tables IV-1 and IV-2 for the air

TABLE IV-1

EMISSIONS TYPICALLY GENERATED BY VEHICLE OPERATIONS DURING HYDROCARBON RESOURCE DEVELOPMENT IN THE GULF OF MEXICO

Resource Extraction Phase	Activity Level Factor	Carbon Monoxide (CO)	Hydro-Carbons (HC)	Nitrogen Dioxide (NOX)	Sulfur Dioxide (SO2)	Total Suspended Particulates (TSP)
GEOPHYSICAL EXPLORATION[a]	1	13.780	1.280	1.380	0.423	0.582

[a] Emissions tabulated are those generated by helicopters and pull boats.
Source: COE, 1984.

TABLE IV-2

GASEOUS EMISSIONS TYPICALLY GENERATED BY ONSHORE AND OFFSHORE OPERATIONS FOR A DEEP STRATIGRAPHIC TEST

Pollutant	Maximum[1] Emission Rate pounds per day	
	Onshore	Offshore
Total Suspended Particulates (TSP)	1.57	20.12
Sulfur Dioxides (SO_2)	1.29	19.84
Carbon Monoxide (CO)	24.06	65.06
Hydrocarbons/Volatile Organic Compounds (VOC)	2.55	11.37
Nitrogen Oxides (NO_x)	11.09	288.39

[1] Maximum expected for one day, assuming that all sources are operating at the onshore base and the rig at the same time.

Source: USDI, MMS, 1984c.

emissions levels that would typically be expected for G&G operations in the GOM. Any site-specific information will be addressed in an SEA.

B. IMPACTS CONCERNING THE BIOLOGICAL ENVIRONMENT

1. Impacts on Coastal Habitats

Impacts to the coastal environment from G&G exploration activities in the GOM would result from oil spills and increased boat traffic. Oil spill impacts are discussed in detail in Section IV.B of the draft EIS (USDI, MMS, 1984a). Increased boat traffic alone would cause a slight increase in discharge to the surrounding waters and extra wave disturbance to the shoreline (USDI, MMS, 1984b).

2. Impacts on Offshore Habitats

a. Impacts on the Pelagic Environment

Acoustic surveys employing a sound source for depth recording or subsurface analysis may result in temporary confusion of sensitive animals such as porpoises and sharks. The animal soon becomes acclimated to the sound and is capable of filtering out the extraneous pulses and distinguishes them from their own echosoundings. The effect of intermittent sound transmitters, which is the type used in geophysical prospecting, is not as great as continous sound sources (USDI, GS, 1976b). The size of the disturbance resulting from an acoustic survey would be a 1° to 30° cone, to hundreds of meters in the direction aimed (USDI, BLM, 1973).

Table IV-3

Mortality Radii (1)
55 Pound Charge
1 Pound Fish

Water Depth of Detonation	Water Depth of Fish	Mortality %	Approximate Minimum "Safe" Distance
83 ft (25m)	5 ft (1.5m)	No injury	874 ft (271m)
83	5	1%	494 ft (153m)
83	5	50%	360 ft (112m)
83	83	No injury	2,660 ft (825m)
83	83	1%	1,235 ft (383m)
83	83	50%	798 ft (247m)
248 ft (75m)	5	No injury	935 ft (290m)
248	5	1%	760 ft (236m)
248	5	50%	494 ft (153m)
248	248	No injury	(2)
248	248	1%	(2)
248	248	50%	(2)

Note: (1) Disregards total depth of water column.
(2) Not computable or data unreliable.
Source: USDI, GS, 1981.

Table IV-4

Mortality Radii (1)
55 Pound Charge
11 Pound Fish

Water Depth of Detonation	Water Depth of Fish	Mortality %	Approximate Minimum "Safe" Distance
83 ft (25m)	5 ft (1.5m)	No injury	494 ft (153m)
83	5	1%	304 ft (94m)
83	5	50%	209 ft (65m)
83	83	No injury	(2)
83	83	1%	(2)
83	83	50%	(2)
248 ft (75m)	5	No injury	893 ft (277m)
248	5	1%	456 ft (141m)
248	5	50%	285 ft (88m)
248	5	No injury	(2)
248	5	1%	(2)
248	5	50%	(2)

Note: (1) Disregards total depth of water column.
(2) Not computable or data unreliable.
Source: USDI, GS, 1981.

The use of airguns as an acoustic energy source is expected to have minimal impact on the pelagic environment. Air gun operations do not produce the massive energy pulse that unconfined explosives produce. While explosives are known to kill fish in the immediate vicinity and produce injuries further away, air gun operations are not known to damage marine life (COE, 1984).

Less than five percent of marine seismic surveying is accomplished through the use of explosives (USDI, GS, 1976b). In the few instances where explosives are used, marine flora and fauna may be damaged and destroyed, depending upon their proximity to the explosive on detonation. Tables IV-1 and 2 indicate the mortality radii to be expected using a 55 pound explosive charge for one pound and 11 pound fish, respectively. Smaller fish have to be farther away from the detonation site than do larger fish in order to experience the same percent mortality. Fish at shallow depths are less affected by deeper explosions than fish at the same depth as the detonation.

The noise of the explosion would probably only have a startle effect on most marine organisms. No long-term deleterious effects on these animals are expected since they would simply move away from the source of the noise. Investigators have consistently reported that fish return to an area after explosions have occurred with no irreversible effects on populations. Fish trawls in the same area before and two hours after detonation of underwater charges produced almost equal yields.

Underwater explosions have little impact on plankton. Because they are filled with fluid, which is incompressible except at high pressure, an increase in water pressure equally on all sides will have little or no effect (USDI, GS, 1981).

Regulations prohibit the use of explosive charges unless specifically approved by the Regional Supervisor (RS), Resource Evaluation (RE), Minerals Management Service (MMS), based on his concurrence with the RS, MMS, Leasing and Environment (LE) that the use of explosives would not have a significant adverse effect on the environment. Those persons who wish to use explosives in explorations on the GOM OCS must obtain a permit before beginning such work and must comply with any stipulated conditions that the RS imposes as necessary for the protection of natural resources and aquatic life.

Discharges from drilling rigs used for DST represent another impact-producing aspect of G&G exploration. There may be a temporary and localized adverse effect on the phytoplankton and zooplankton due to the plume caused by the temporary resuspension of bottom sediments during placement of offshore structures and the disposal of drilling muds and cuttings. The impacts on the plankton would depend on the residence time for the organisms within the plume. Primary productivity could be affected by reducing the photosynthetic assimilation of photoplankton within the affected area. Zooplankton in the immediate vicinity of the turbidity plumes may be adversely impacted by clogging of the filter-feeding mechnisms or blocking of respiratory surfaces.

Other nekton are highly mobile and would probably avoid localized areas of disturbance. Nektonic organisms, especially fish, would be attracted to the submerged rig, especially at night when the rig is well lighted. Observations in the GOM indicate that fish are also atracted to drill cuttings as they settle through the water column. The free-swimming organisms have the ability to evade or swim freely through the plume and experience has indicated that no serious long-term effects would be experienced by these organisms (USDI, MMS, 1984b).

Other types of discharges from the rig, such as engine cooling water or an accidental oil spill, may also affect the pelagic inhabitants. Oil spill impacts are discussed in Section IV.B of the draft EIS (USDI, MMS, 1984a).

b. Impacts on the Benthic Environment

Benthic organisms may be destroyed during sediment sampling. Refer to Section IV.A.1 of this EA for a discussion of the minimal area of the sea bottom disturbed during G&G sampling operations (USDI, GS, 1976b). Light disturbance resulting from a visual survey would cause disturbance to an area in size equaling a 40° cone, to tens of meters in the direction aimed (USDI, BLM, 1973).

Solid or liquid explosives approved for use in geophysical exploration in the GOM OCS must be detonated no closer than 5 feet (1.5 meters) from the seafloor. Minimal effects on benthic communities would be expected. The commercially important species such as lobsters, crabs, and clams are highly resistant to shock because of the lack of a swim bladder and/or the presence of an exoskeleton (USDI, GS, 1981).

The use of airguns as an acoustic energy source is expected to have no impact on the benthic marine environment. A comprehensive investigation of the effects of compressed air charges on the water column, water bottom, and marine life (oysters) was conducted by marine biologists of the Louisiana Wildlife and Fisheries Commission due to concern about the effect of acoustic energy sources on the marine environment. The experiments were conducted in Sister Lake, Terrebonne Parish, Louisiana, in water depths from 3 to 5 feet (0.9-1.5 meters) at two separate locations, including hard shell and soft mud bottoms. Normal seismic survey operating procedures were used in the tests. The evidence from the tests indicated no damage to the water, water bottom, or oysters from the air blasts. The oysters were examined daily for approximately three months after the completion of the tests for evidence of mortality or abnormality. General observations indicated that no fish or other marine animals were affected (USDI, GS, 1976b).

The major impact of drilling activity associated with shallow coring or a DST to the benthic environment would be the smothering of sessile invertebrates caused by disturbance to the seafloor and the discharge of drilling muds and cuttings. Fauna generally recolonize the deposits quickly; however, the post-drilling species may differ from pre-drill species.

On the OCS, about 90% of the discharge settles rapidly usually within 3,281 feet (1,000 meters). The cuttings pile may persist or be dispersed depending on the energy of the sea bottom. In addition to the smothering effect, chemical (toxicity) effects might be expected especially among organisms which feed on the substrate. However, most water-based drilling fluids are relatively nontoxic, and their effects are restricted primarily to the immediate vicinity of the drill site (USDI, MMS, 1984b).

Impacts to the benthos resulting from oil spills are discussed in Section IV.B of the draft EIS (USDI, MMS, 1984a).

c. Impacts on Sensitive Underwater Features

The impacts to the sensitive underwater features of the GOM OCS area (hard and live bottoms) would be the smothering and toxicity effects resulting from drilling discharges involved in shallow coring or a DST as discussed in

Section IV.B.2.a of this EA. However, recolonization by the live bottom assemblage may be precluded by a modification of the substrate. Due to their sensitive nature and high productivity, destruction on these habitats should be avoided.

Shunting of the effluents tends to increase the exposure of benthic organisms to wastes in the immediate vicinity of the drill site. Shunting is an effective mitigative measure in areas near topographic highs, since generally, the effluent would be restricted from the highs where sensitive biota are often located (USDI, MMS, 1984b).

G&G operations must avoid impacting the no activity zones of sensitive undersea features. Impacts to specific sensitive features will be assessed in an SEA along with appropriate mitigative measures.

Impacts to sensitive underwater features resulting from the use of explosives, airguns, and sediment sampling would be the same as those to the benthos. Oil spill impacts are discussed extensively in the draft EIS (USDI, MMS, 1984a).

3. Impacts on Endangered or Threatened Species

In accordance with Section 7(c) of the Endangered Species Act of 1973, as amended, a request to reinitiate consultation on the proposed GOM sales was sent to FWS and National Marine Fisheries Service on November 10, 1981. The biological opinions from these agencies (Appendix) indicate that leasing and exploration activities associated with this area are not likely to jeopardize the continued existence of the listed species considered in the consultations or result in the destruction or adverse modification of their critical habitats. However, FWS indicated that consultation must be reinitiated should any additional onshore facilities be established along the Gulf coast in support of exploration activities, particularly south of Tampa Bay, Florida (Port Manatee). Additional onshore facility construction is not expected in support of G&G activities since vessels utilize existing port facilities.

Increased support vessel traffic between ports and offshore surveying sites could result in collisions with basking loggerhead turtles. The level of this problem is unknown and requires additional research. Lights on the drilling rig could also attract or disorient marine turtles during their post-natal drive to reach favorable currents. Studies have not been conducted to determine the impact of oil and gas operations on marine turtles and their habitat; therefore, such impacts are difficult to evaluate. The primary reason for the endangered status of the manatee is attributed to mortality from collisions with boats and barges. Increased offshore support boat traffic could result in boat collisions with manatees. Boat collisions with whales are also possible but considered unlikely. Increased marine traffic could disrupt feeding and/or migration behavior, and traffic collisions involving these animals could increase. Data are not available to adequately estimate the impacts which could result from the above described activities; therefore, probable impacts on marine mammals and their habitats cannot be predicted with any degree of reliability.

Impacts to offshore endangered/threatened species from drilling discharges, the use of explosives, and airguns would be the same as the pelagic environment. Oil spill related impacts to endangered or threatened species are discussed in Section IV.B of the draft EIS (USDI, MMS, 1984a).

4. Impacts on Breeding Habitats and Migration Routes

The major impact producing agents which could potentially impact the breeding habits and migration routes of species in the GOM OCS area include OCS related oil spills, disturbance from onshore facility construction, and collisions with marine vessels and aircraft. Refer to Section IV.B of the draft EIS (USDI, MMS, 1984a) for a discussion of potential oil spill related impacts. Additional onshore facility construction is not expected to support G&G activities since vessels utilize existing port facilities.

Increased OCS-related traffic between onshore ports and surveying sites could result in collisions with marine mammals, turtles, and birds. The current level of such impacts is unknown and it is difficult to predict to what extent such impacts could increase without additional research. However, it is believed that the current impact level is very low and unlikely to increase substantially as a result of increased G&G exploration activity in the area.

Potential impacts to specific endangered/threatened species are discussed in detail in Section IV.D of the draft EIS (USDI, MMS, 1984a).

5. Impacts to Protected Areas of Biological Concern

Refer to Section IV.B.2.c of this EA.

C. IMPACTS ON SOCIOECONOMIC CONDITIONS AND CONCERNS

1. Impacts to Economic and Demographic Conditions

The socioeconomic effects expected to result from offshore exploratory G&G operations in the GOM are minimal due to the transitory nature of the activity. There is little incentive on the part of the oil and gas industry to establish extensive facilities or for workers to establish permanent residences prior to the proven existence of commercial quantities of hydrocarbons (Herbert and Lampl, 1983).

a. Impacts on Local Employment

Employment in the oil and gas industry is affected by many factors including the production of crude petroleum and natural gas, level of petroleum refining activity, and meteorological conditions. Small numbers of employees may be relocated to existing facilities for a short duration (USDI, MMS, 1984b). Usually, two survey vessels are used. Work can be conducted on a 24-hour basis, so the crew sleeps on board. The survey team comes to shore only between contracts, or to take on supplies and fuel (COE, 1984).

Survey vessels have no discernible impacts on coastal communities. Shipboard labor is contracted with the vessel offering no local employment opportunities. Onshore businesses that provide the services needed by this type of vessel, such as marine fuel and food supplies benefit from additional business (Clark, Zinn, and Terrell, 1978).

b. Impacts on Local Population and Industry Centers

Most of the personnel engaged in G&G exploration activities will not change their places of residence. Minimal effects upon local population centers and industry are expected.

2. Impacts on Land Use

a. Impacts of Increased Demands on Community Services

Previous G&G exploration activities in the area were supported by existing community services; therefore, no impacts are expected.

b. Impacts of Increased Boat and Air Traffic

Marine vessel and helicopter operations between onshore support bases and ports and offshore sites will insignificantly increase; therefore, additional vessel traffic in support of operations should not significantly affect the existing vessel traffic.

c. Impacts of Competition for Scarce Coastal Resources and Demands for Goods and Services

Previous G&G exploration activities in the GOM have been supported by existing services and supplies; therefore, no additional demands for coastal resources, goods, and/or services are expected. Geophysical survey vessels require berthing space similar in size and needs to a commercial fishing vessel. The rig for a DST is identical to an exploratory rig and has similar onshore and offshore support requirements (Clark, Zinn, and Terrell, 1978).

3. Impacts of Construction of Onshore Support Facilities

No construction of new onshore support facilities is anticipated to support G&G exploration activities. Therefore, no impacts are expected.

4. Impacts of Public Opinion

No significant public opposition to G&G exploration activity in this socioeconomic area has been expressed. Increased activity would be expected to ellicit a favorable public response as it would serve to maintain employment levels in specialized areas.

5. Impacts on Navigation

Operations between the port from which the vessels will operate and the OCS will result in increased marine traffic in certain areas. Navigation corridors have been established for the safe passage of vessels enroute to or from United States ports. However, an unknown number of ships do not use these corridors, thereby increasing the possibility for a collision with geophysical ships, drilling rigs, and their attendant vessels (USDI, MMS, 1976b). A seismic vessel towing a two mile (3km) long seismic cable could affect ship traffic if precautions were not taken. Although the seismic cable is designed to operate relatively deep and ships could pass over the cable, under safe operating practices ships are not allowed to pass between the survey ship and the tail buoy. Impacts which could result include loss of human life and partial or complete destruction of drilling rigs and the ship. The extent of this potential problem is unknown, but the fraction attributable to G&G activities would be small (COE, 1984). Vessel traffic during G&G operations would have only minimal impact on other ships in the area by requiring them to make minor course adjustment when the ships are sighted (USDI, GS, 1981). Operations can be planned to avoid the heavy traffic when fishing fleets move to and from their home ports by having survey operations avoid crossing the main navigation channels during such times (COE, 1984). Offshore structures may serve as navigational aids and areas of safety for small boat operators during storms.

6. Impacts Concerning Military Use

The GOM OCS waters are used rather extensively by the Navy and Air Force for conducting military training and research operations. These activities consist of missile testing, ordnance testing, drone recovery operations, and electronic counter measure (ECM) activities by the Air Force. Mine research activities are conducted by the Department of the Navy. Most of this activity takes place in areas designated for these purposes. However, live ordnance testing by the Air Force occasionally involves emergency release of ordnance outside designated bombing areas. These ordnances range from small munitions to 1200-pound bombs. The possibility of occurrence of unexploded munitions on the ocean floor in G&G exploration permit areas does exist but the chance of encountering such ordinance during bottom sampling, core testing, or deep stratigraphic testing is extremely remote (USDI, GS, 1976b).

Temporary emplacement of the jack-up or semisubmersible drilling rig used for DSTs could result in interference with military activities. In order to promote a compatible joint usage of an area, negotiations between the Department of the Interior (DOI) and the Department of Defense (DOD) have resulted in a Memorandum of Agreement (1983) between the two. It establishes procedures for resolving all conflicts prior to any offshore activity by lessees. Utilization of offshore areas by DOD is provided for in 32 CFR 252. The DOD policy of joint usage and coordination with DOI to ensure compatibility between programs is expressed within the regulation (USDI, MMS, 1984a).

7. Impacts on Commercial Fishing

Geological and geophysical activities may interfere with commercial fisheries through removal of seafloor and pelagic areas from use by trawlers. Shrimp and industrial bottom fish are caught by dragging a large trawl across the seafloor. All sites occupied by exploratory drilling structures and attendant service boats and barges used for DSTs or shallow drilling activities must be avoided by trawlers. If the structures are jack-up drillings rigs, the area of the seafloor removed would amount to 2 to 5 acres for each structure. In deeper waters (over 300 feet, 95 meters), a semisubmersible drilling rig with its anchoring system would occupy up to 325 acres, assuming a 1,500 foot (460 meter) anchoring radius. The duration of a DST is generally between 90 to 120 days. Upon completion of the deep stratigraphic test, the hole is plugged and abandoned. Cement plugs are set to confine formation fluids in their present subsurface formations. During plugging operations well control equipment (blowout preventers) remains in use until the cement plugs are set; the casing is cut off at least 15 feet below the mud line, all obstructions are removed, and the bottom dragged to make sure no obstructions are overlooked. All plugging and abandonment operations are conducted pursuant to OCS Order No. 3.

Large pieces of debris, (i.e., equipment, piping, tools, structural members) may accidentally be lost off a structure, supply boat or barge. If this occurs off or near a structure, it may be located easily by divers and retrieved if the water is shallow enough to enable such operation. However, if it is lost off a boat or barge underway, the location may not be known accurately enough to allow its subsequent recovery. Depending on the size and weight of items lost in this way, varying amounts of damage may be done to trawling nets or other equipment of fishermen.

Drilling operations in some fishing areas during a particular season could preclude fisheries harvest. In some instances, long hydrophone streamers used in geophysical surveying interfere with fishing activities. It is possible that machinery noise associated with drilling activities could intefere with fishing activities. Refer to Section IV.B.2.a of this EA for a discussion of possible impacts of air guns and explosives. Fish, either externally coated or internally contaminated with oil, are unmarketable. The level of oil spillage resulting from G&G exploration drilling activity is believed to be negligible.

Pursuant to 50 CFR Part 296, a Fisherman's Contingency Fund was established to compensate commercial fishermen for eligible claims for actual and consequential damages, including loss of profits, due to damage to or loss of fishing gear by materials, equipment, tools, containers, or other items associated with oil and gas activities on the OCS. This includes unleased areas used extensively by surface vessels supporting OCS oil and gas activities, which is the case for G&G permitting (USDI, GS and BLM, 1981).

8. Impacts on Recreation/Tourism

G&G explorations will increase the boat traffic slightly and operational equipment may reduce the quality of recreational boating for some individuals.

If air quality permits unlimited visibility, some portion of a one hundred foot structure can be seen from the beach if it is located 17 miles (31km) or less from shore. The sight of offshore equipment might be considered aesthetically unpleasant and a detrimental factor to the quality of outdoor recreation activities (e.g., beachcombing, shoreline nature study, camping, and sunbathing).

Bottom sampling and drilling would make an area undesirable for underwater sports such as scuba diving. Any floating material that is cast up on the beach or washed into a bay would constitute an impact upon the aesthetic or real values for users or owners of the area.

The objective of the operators in G&G prelease exploration activities is to identify various rock strata and obtain information on geologic structures. Appropriate safety devices are required to contain any unexpected oil and gas occurrence. If oil and gas are encountered and a safety device fails, it may possibly disrupt swimming, boating and outdoor activities. Oil spills might reach the beaches and estuarine areas, making boating and shoreline recreational activities undesirable, and the flora and fauna of the shoreline could be damaged. The probability of such extensive damage from prelease exploration activity is highly unlikely. Refer to Section IV.B of the draft EIS (USDI, MMS, 1984a) for an extensive discussion of potential oil spill impacts.

9. Impacts to Cultural Resources

A "cultural resource" may be defined as "a site, structure, or object of historic or prehistoric archaeological significance" (USDI, MMS, 1983d). Previously unknown underwater prehistoric archaeological and historic shipwreck sites may be damaged by bottom sampling, core drilling, and deep stratigraphic testing on the OCS, although the probability of impacts is remote. Applicants may not use solid or liquid explosives within 5 feet (1.5 meters) of the seafloor; therefore, no impacts to potential cultural resources from explosives are anticipated.

Geological and geophysical activities for mineral exploration or scientific research activities authorized under 30 CFR Part 251 are required to be conducted so that they do not disturb cultural resources. Procedures are described under 30 CFR Part 251.6-2(e) which may require a permittee to conduct cultural resource studies and to minimize any potential damages to cultural resources under the authority to drill a DST. Any such requirements would be addressed in a SEA prepared for that permit activity and would be conditional to the granting of the permit.

Geophysical surveying, including the use of the magnetometer, side-scan sonar, and subbottom profiler, and geological activities including bottom sampling are methods which are utilized to identify cultural resources on the OCS and may lead to the eventual preservation of cultural resources (USDI, GS, 1976b).

In order to ensure maximal protection to cultural resources for routine G&G permit activities (other than DSTs), the following mitigation/protective measure has been formulated as a standard condition for all G&G permit activities:

"If the permittee discovers any cultural resource while conducting permit activities, the permittee shall report the discovery immediately to the RS for RE. The permittee shall make every reasonable effort to preserve the cultural resource until the RS has told the permittee how to protect it."

10. Impacts or Other Commercial Uses

Geological and geophysical exploration activities are not expected to impact any other commercial uses of the Gulf of Mexico OCS.

11. Impacts on Other Mineral Uses

No impacts are expected.

12. Impacts Concerning Pipelines and Cables

Offshore oil and gas pipelines are considered impact-producing factors of special concern on the basis of potential space/use conflicts. Some minor space/use conflict which may result from the operation of G&G vessels in relation to other vessels involved in pipeline emplacement, including the pipeline lay barge, tugboats, and other support vessels. Pipeline impacts are fully discussed in the Regional Environmental Assessment, Gulf of Mexico Pipeline Activities (USDI, MMS, 1983f).

13. Impacts of Ocean Dumping

There is one EPA-approved deep water disposal area in the GOM. It is unlikely that impacts associated with ocean dumping will affect or be affected by G&G activities within the GOM OCS area.

D. UNAVOIDABLE ADVERSE IMPACTS

Localized and short-termed impacts would be expected to result from G&G exploration activity on the GOM OCS. Most of these impacts would not be considered to be irreversible.

The unavoidable adverse effects from G&G exploration activity include some destruction of marine life, air and water quality degradation, and conflict with other uses of the OCS (USDI, GS, 1976b).

Destruction of marine life may result from possible use of explosives in seismic surveys, bottom sampling, discharge of drill cuttings, fluids, and the remote possiblity for accidental oil spills and ship discharges. Bottom disturbances and turbidity plumes induced by installation of the drilling rig for a deep stratigraphic test and the discharge of drill cuttings and muds should have localized short-termed effects on marine organisms. Benthic communities occupying disturbed areas would suffer direct and indirect mortality. Long-term effects would only result from introduction of material differing in chemical and physical makeup which could alter the composition of the recolonized benthic community. The turbidity plumes induced by the various activities could reduce the photosynthetic assimilation of the photoplankton populations inhabiting the area. Zooplankton may be adversely impacted by clogging of the filter-feeding mechanisms or by blocking the respiratory surfaces. Plankton populations would be subjected to intermittent losses in the vicinity of a drilling site during drilling. The adverse effects on marine life would be minor due to the low level of G&G exploration activity employing the techniques mentioned above and the limited area affected by these activities.

Air quality degredation would result from emissions from marine engines, aircraft and helicopter engines, and drill rig powerplants. Although emissions, in varying quantities at intermittent intervals, could be generated during drilling operations, the extent of the area affected would be localized since the prevailing climatic conditions would dilute and disperse the pollutants. Non-combustible gas blowouts and combustible oil blowouts could also adversely affect the air quality in the vicinity of the drilling operations, with the degree of air quality degradation being determined by the quantity of pollutants emitted, the duration of the blowout, and the prevailing climatic conditions. The minor emissions produced by marine vessels and helicopters should not have any significant effect on the onshore air quality.

Temporary water quality degradation would result from turbidity created by bottom and core samplers. Rig installation and the discharge of drill cuttings and muds from a DST may alter or degrade the water quality be resuspension of sediments and the release of entrapped pollutants into the water column. Normally, these activities have localized effects with short-termed persistency because of the dilution effects of a water body the size of the GOM. Discharges of treated liquid waste and concentrated seawater would also be rapidly diluted to background levels; therefore, no significant water quality degradation is expected (USDI, MMS, 1984b). Accidental oil spillage or bilge pumping from G&G exploration activities is expected to be insignificant and can be minimized through careful operational practices including collection and onshore disposal of wastes (USDI, MMS, 1984b).

Conflicts with other uses of the OCS may occur. Deep stratigraphic testing will remove a small acreage of the OCS from commercial fishing for 90 to 120 days. Deep stratigraphic test holes of greater than 15,000 feet (4,600 meters) could require from three to six months to complete operations. Varying amounts of the seafloor would be removed from commercial sea trawling, depending upon the specific mechanisms used. Although this is recognized as an adverse impact, the degree and extent of the effect is unknown. There also exists a potential for boat collisions with a drilling rig; however, this is unquantifiable. There may be a conflict with military operations conducted in the vicinity of G&G activities. Ships conducting and servicing G&G exploration activities will increase to a slight extent the possibility of collisions with other marine traffic. Accidental oil spills and bilge discharges may affect the use of small areas of the OCS waters and possibly recreation areas along the coast, if carried onshore. Accidents and spills can be avoided through careful, safe operating practices (USDI, GS, 1976b). The possibility for oil spills resulting from G&G operations is remote.

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SECTION V

CONSULATION AND COORDINATION

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V. CONSULTATION AND COORDINATION

This section will be addressed in an SEA.

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SECTION VI

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SECTION VII

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SECTION VII

APPENDIX

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VIII. APPENDIX

ENDANGERED AND THREATENED SPECIES BIOLOGICAL OPINIONS

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ADDRESS ONLY THE DIRECTOR
FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

In Reply Refer To:
FWS/OES MMS-82-1

OCT 25 1982

MEMORANDUM

To: Director, Minerals Management Service

From: Chief, Office of Endangered Species

Subject: Amended Biological Opinion for the Lease and Exploration of Outer Continental Shelf Lands in the Gulf of Mexico Region

By memorandum received November 10, 1981, the Bureau of Land Management (BLM) and the Geological Survey (GS), now a part of the Minerals Management Service (MMS), requested the reinitiation of formal consultation with the U.S. Fish and Wildlife Service (FWS) under Section 7(a) of the Endangered Species Act to consider all of the operations pertaining to Outer Continental Shelf (OCS) oil and gas leasing and exploration in the Gulf of Mexico OCS Planning Area.

An original Section 7 consultation on the lease and exploration of OCS lands in this area occurred in 1979 with a biological opinion being rendered to BLM and GS April 10, 1979 (copy attached). Consultation was reinitiated on the basis of an extension of the boundaries of the Gulf Region as well as on an oilspill analysis for the Region.

A consultation team consisting of Wayne Milstead, Office of Endangered Species (OES), Team Leader; Bob Cooke, FWS, Region 4 Office, Atlanta, Georgia; and Jim Barkuloo, FWS, Panama City, Florida, was appointed and attended a meeting with representatives of MMS in New Orleans on December 2-3, 1981. The consultation team requested information on any new potential onshore facilities in the Region and an analysis of the probability of oilspills occurring as a result of the action. Since the information was not forthcoming and the 90-day period for consultation had run out, a memorandum was sent to MMS on March 4, 1982, requesting that formal consultation be delayed until the information requested was made available. On March 13, 1982, the information requested was received from MMS, but as a result of subsequent conversations with MMS personnel it was discovered that the oilspill analysis had been revised. Final, up-to-date oilspill information was received in OES on April 13, 1982, at which time the formal consultation period was resumed.

[Following submission of a biological opinion on June 30, 1982, the FWS felt that new information received on the potential impacts of this project on listed species was sufficient to necessitate a revision, resulting in this amended version.]

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

ADDRESS ONLY THE DIRECTOR
FISH AND WILDLIFE SERVICE

In Reply Refer To:
FWS/OES

OCT 25 1982

MEMORANDUM

To: Director, Minerals Management Service

From: Chief, Office of Endangered Species

Subject: Amendment to the June 30, 1982, Biological Opinion for the Lease and Exploration of Outer Continental Shelf Lands in the Gulf of Mexico Region

Following completion of the biological opinion of June 30, 1982, we received comments from within the Fish and Wildlife Service pointing out that we may have been overly generous and incorrect in our interpretation of some results contained in a draft report on the Effects of Petroleum on the Development and Survival of Marine Turtle Embryos by Fritts and McGehee. After reviewing these comments and the final report on this subject, we feel this constitutes new information on a listed species sufficient to justify an amendment to our June 30, 1982, biological opinion. Therefore, attached you will find an amended biological opinion for the Lease and Exploration of the Outer Continental Shelf Land in the Gulf of Mexico Region which supercedes the opinion of June 30, 1982.

Although the major change in this amended opinion relates to the comments on sea turtles, several other changes and additions have been made for purposes of emphasis, most particularly to emphasize an existing concern for potential impacts on the American crocodile. Nevertheless, the final opinion in this amended version remains the same as in the June 30, 1982, biological opinion. All additions are identified by being enclosed in brackets. Deletions are relatively few, and consist largely of the general comments on sea turtles, but others can be determined by cross-checking with the original opinion (paragraphs one and three on Page 2 of this version are the next largest deletion).

If you have any questions, please contact Wayne Milstead in this office (phone FTS 235-2760).

Attachment

The following listed Endangered or Threatened species were considered during this consultation as being potentially affected by the action: bald eagle (Haliaeetus leucocephalus), brown pelican (Pelecanus occidentalis), loggerhead sea turtle (Caretta caretta), Kemp's (=Atlantic) Ridley sea turtle (Lepidochelys kempii), West Indian (Florida) manatee (Trichechus manatus) and its Critical Habitat, [American crocodile (Crocodylus acutus) and its Critical Habitat,] and whooping crane (Grus americana) and its Critical Habitat. [The status of other species included in the April 10, 1979, biological opinion has not changed substantially. The extension of the lease area and the oilspill risk analysis will not result in changes in the 1979 opinion for these species.]

The Gulf area involved in this consultation includes the outer continental shelf lands not presently under lease that are north of a line running east from approximately the U.S.-Mexican border on the coast at 26 degrees north latitude to 88 degrees west longitude where it jogs north 1 degree latitude, then east again 2 degrees west longitude to 86 degrees west longitude with another diversion south 2 degrees latitude to 25 degrees north latitude and finally east toward the Florida coast until a final jog north along 82 west degrees longitude intersects the Florida coast just south of Charlotte Harbor (Figure 1). This consultation considers the effect of all activities associated with the lease and exploration of lands within this area on listed Endangered and Threatened species under the jurisdiction of the FWS.

[A major change which brought about the reinitiation of the previous consultation was the addition of a "frontier" lease area off southwest Florida between 26 degrees and 25 degrees north latitude. In addition, new information on Gulf-wide OCS activities was provided in the form of an oilspill risk analysis for the development/production phase in the region. This opinion, therefore, concentrates on those species which are within or adjacent to this "frontier" area. Comments will generally reference the previous biological opinion of April 10, 1979, and the statements in that opinion stand unless new information necessitates additional comment or allows a change in any part of that opinion.]

Exploration of the OCS requires certain onshore facilities that might include office space, helicopter and fixed-wing aircraft facilities, boat docks, and support bases. There is an extensive history of intensive oil and gas activity in the Gulf of Mexico, and numerous onshore facilities have been established throughout the Region. The availability and necessity of onshore facilities appears to remain as they were at the time of our April 10, 1979, biological opinion, and it would seem unlikely that additional lease and exploration of the OCS in the Gulf Region will result in the development of additional onshore support facilities. Should the use of existing facilities be changed or additional onshore facilities be needed which may affect listed species or their habitats, consultation must be reinitiated.

Although not available for the 1979 consultation, an oilspill risk analysis has been provided for this reinitiation. It gives the percent probability that one or more spills of 1000 barrels or more will occur, from a variety of sources, during the life of the project and that they will strike various targets and/or land segments along the Gulf Coast within 3, 10, or 30 days after initiation of the spill. This analysis is based on activities that can be expected to be associated with the development and production phases of the project following lease and exploration, and this consultation is on the lease and exploration phases only. Probabilities are broken down into spills expected to result from three cumulative categories of events: (1) the proposed lease sale only, (2) the proposed sale plus existing leased OCS lands, and (3) the proposed sale plus existing leased lands, as well as oil imports moving through the lease area. The life of the proposal is considered to be 40 years. If the third category of events leading to oilspills that will strike various targets within 30 days (proposed sale, existing activities, and imported oil) is considered the worst case situation, some figures are very high. This is particularly true of land segments in the western Gulf where probabilities from the proposed lease alone are from 13 percent at Aransas County, Texas (whooping crane wintering range), to 67 percent at Saint Bernard Parish, Louisiana (a brown pelican nesting site); and if existing leased lands plus imported oil are included, these figures increase respectively to 51 percent and 93 percent.

Although the general statements and considerations provided for each species in the 1979 biological opinion are still appropriate, [the addition of a "frontier" area and] the introduction of oilspill data necessitates an additional consideration of potential impacts on some species. [The West Indian manatee, American crocodile, brown pelican, and loggerhead sea turtle are the species most likely to be impacted as a result of the extended lease area. Other limited species are considered here because of the potential for impacts as oil and gas activities increase throughout the Region.]

Bald Eagle (Haliaeetus leucocephalus)

The discussion in the 1979 biological opinion regarding the possible contamination of the bald eagle's food source by an oilspill is emphasized by the high probabilities of such spills reaching segments of the Texas and Louisiana coast in reasonable proximity to bald eagle nesting territories. It can be expected that bald eagles might be attracted to the area of a spill by dead and dying fish and birds as a food source and thereby consume oil adhering to prey species. Nevertheless, evidence from other species of birds suggests that adult birds may be able to tolerate the ingestion of fairly high concentrations of crude oil. Also, the direct effect of oil on plumage is perhaps not as significant a factor with bald eagles since adults, at least, tend to have minimal contact with the water from which they are taking prey.

However, the more important adverse impact of an oilspill on bald eagles would probably be on reproduction through contamination of eggs from adults carrying oil on breast feathers and feet.

Nesting territories are found in or near Refugio (land segment 6), Calhoun (land segment 7), Matagorda (land segment 8), and Brazoria (land segment 9) Counties, Texas, and the relatively high probabilities of oilspills striking these areas (13 percent, 24 percent, 45 percent, and 32 percent respectively) are of concern. Similarly, active bald eagle nesting in the Mississippi delta region of Louisiana from land segments 16 to 21, along with associated oilspill probabilities of 54 percent, 40 percent, 17 percent, 86 percent, 67 percent, and 31 percent respectively suggests a high level of threat to the recoverability of the species in the western Gulf Region. [The status of this species in the eastern and central Gulf Regions is essentially the same as discussed in the 1979 biological opinion.]

Brown Pelican (Pelecanus occidentalis)

Few brown pelican nesting sites remain in the western Gulf of Mexico. Three sites exist along the Texas coast, Pelican Island, Nueces County (land segment 5), and Second Chain of Island and Sundown Island, Calhoun County (land segment 7). Also, pelicans range over much of the Texas coast from land segment 4 (Kleberg County) north to land segment 8 (Matagorda County). Probabilities of oilspills resulting from the proposed sale striking land segments 5, 6, and 7 are 22 percent, 13 percent, and 24 percent respectively. These figures are increased to 44 percent, 51 percent, and 61 percent when oil from existing leased OCS lands and oil imports are included as a factor.

In Louisiana, only two small restored nesting colonies exist, one on Queen Bess Island, Jefferson Parish (land segment 18) and the other on North Island, Saint Bernard Parish (land segment 20). The probability of oilspills from the proposed lease activity striking these two segments is 17 percent and 67 percent respectively.

When the effects of existing leased OCS lands and imported oil is included, these probabilities increase to 69 percent and 93 percent. Such high values nearly assure that one or both of these two fragile nesting sites will be affected by one or more oilspills of 1000 barrels or more within 30 days after release over the 40 years of the project. Even though all these island nesting sites in Texas, as well as in Louisiana, might be partially protected from the direct impact of an oilspill in the open Gulf by seaward barrier islands, the wide-ranging nature of the birds when foraging would amplify the possibility of oil contamination. The most damaging effect of oil contamination on brown pelicans would be on reproduction. Due to the bird's feeding habits, it is reasonable to assume that adult brown pelicans might in fact avoid feeding in oiled waters because of the difficulty of their observing fish beneath the surface. But very small amounts of certain crude and refined oils applied to the surface of eggs cause high embryonic mortality or morphological abnormalities in a variety of avian species. If spills occurred during the nesting season of the brown pelican, oil can be transferred to eggs from feathers or feet of adults resulting in reduction in hatching rate. As with bald eagles, the impact of oilspills on the recoverability of brown pelicans in the Texas-Louisiana coastal region could be substantial. [The status of the brown pelican in the eastern Gulf Region is essentially the same as discussed in the 1979 biological opinion.]

Whooping Crane (Grus americana)

The wintering range of the entire reproducing wild population of the whooping crane exists along a stretch of Texas coast, including a portion of the Critical Habitat (Aransas, Calhoun, and Matagorda Counties), subject to probabilities of being impacted by one or more substantial oilspills of 13 percent, 24 percent, and 45 percent during the life of the proposed lease of these OCS lands. These figures increase to 51 percent, 61 percent, and 86 percent when activities on existing leased lands plus imported oil are added to the oilspill analysis.

These birds feed largely on crabs and clams in tidal flats and shallow bays and channels while wading, and oiled waters in these habitats could pose a considerable threat if a spill occurred between November and late April when the cranes are on their wintering grounds. Again, as with brown pelican nesting sites, this wintering habitat of whooping cranes is protected to some extent from oilspills in the open Gulf by barrier islands, but the loss of even a relatively small portion of a population, estimated to consist of approximately 75 individuals, could have a drastic impact on the continued existence of the species.

Sea Turtles

[Recent studies on the effects of petroleum on the development and survival of marine turtle embryos are inconclusive. The results of these studies indicate that oil remaining on the beach approximately one year after a spill did not cause significant mortality in sea turtle eggs, however, fresh crude oil deposited on top of sand can cause extensive mortality to incubating sea turtle eggs. More definitive information is needed to assess impacts of oiling on sea turtle nesting beaches.]

Loggerhead Sea Turtle - (*Caretta caretta*)

Loggerhead sea turtles nest on several barrier islands along the Gulf coast, in some cases in considerable numbers. The probabilities of an oilspill from all potential sources striking some areas of known loggerhead nesting sites within 30 days are relatively high. For instance, the figures for the Chandeleur Islands, Louisiana (segment 20), has a probability from all sources of 93 percent and Santa Rosa Island, Florida (segment 24), has a probability of 36 percent. [The probability of oil reaching nesting beaches in the "frontier" lease area off Florida as a result of OCS leasing and exploration is near zero.]

Kemp's (=Atlantic) Ridley Sea Turtle - (*Lepidochelys kempii*)

Except for purported occassional nestings along the southern Texas coast, this species nests entirely along an approximately 14-mile stretch of Mexican coast.

Since 1978, the U.S. Fish and Wildlife Service has been involved in a project designed to return these turtles to nesting sites in the U.S. Eggs are collected in Mexico, transported to Padre Island National Seashore, and placed in artificial nests. After hatchlings move from these nests into the water, they are recaptured and raised in "head start" facilities until they are mature enough to be released into the Gulf. It is hoped that this procedure will result in turtles that are imprinted on Padre Island as a nesting site, and that they will return there when sexually mature at approximately 7 years of age. [The impacts of a fresh oilspill on nesting stages of the species would probably be significant if the oil hit the beaches during the nesting season.] The probability of a 1000 barrel or more oilspill striking some part of Padre Island within 30 days of its inception from the proposed sale only ranges from 5 percent to 19 percent, and when present activities are added these climb to 8 percent to 33 percent. Such probability figures are high enough to warrant concern.

West Indian (Florida) Manatee - (*Trichechus manatus*)

The manatee is confined to shallow coastal waters, bays, rivers, and inlets along both coasts of Florida, portions of which are designated as Critical Habitat. The probabilities of one or more oilspills of 1000 barrels or more occurring and striking coastal areas within the range of the manatee on the west coast of Florida within 30 days of release is 6 percent. For any one land segment in manatee range, the highest probability, 3 percent, is found adjacent to the Tampa Bay area. On the basis of this information, it would appear that oiling should not pose much of a threat to the manatee.

Boat traffic has been and remains a major threat to the species, and this was the primary topic of concern in the biological opinion of 1979. In this case, the potential hazard from boat traffic would of course derive from any additional boating activities associated with the lease and subsequent exploration for petroleum in the Gulf OCS.

[American crocodile (Crocodylus acutus)

The extension of the OCS lease area south to 25 degrees north latitude offshore Florida increases the potential for disturbance and impact on the crocodile. The lower Keys population within the National Key Deer Refuge would be within 20 nautical miles of the nearest lease tract offered. The nearest documented nesting population to the lease areas is located within Everglades National Park, approximately 30 nautical miles from the nearest lease tract. The oilspill risk analysis shows a 1 percent probability of oil reaching land in land segment 43 within 30 days, but the probability of it reaching Everglades National Park was less than 0.5 percent. Since the possibility of an oilspill is even less during exploration, and no new onshore facilities are anticipated, the April 10, 1979, biological opinion for the American crocodile is still valid. This includes the provision that "any development/production activities in or near the Cape Sable/Florida Bay area will require Section 7 consultation. At that time, further information will be necessary to determine the effect on the American crocodile. This information should include site specific transportation methods to be used, location of all onshore facilities associated with OCS activities, an oilspill trajectory study including current direction/velocity information, and other pertinent information." Although an oilspill risk analysis is now available, there may be a need for more site specific or refined information on oilspill trajectories in case of development/production.]

Conclusion, Advisory Statement, and Cumulative Effects

There are two areas of concern when considering potential affects of leasing and exploring OCS lands in the Gulf of Mexico on Endangered or Threatened species. One is the development of onshore facilities that are either support bases directly associated with exploration activities or marine terminals, refineries, gas processing plants, pipelines, etc. that are associated with subsequent development and production activities. Second is the chance that, if discoveries are sufficient and production occurs, oilspills of significant size may occur and impact listed species and/or their habitats.

In your memorandum of March 11, 1982, you stated that the existing support base at Port Manatee, Florida, is the most likely one to be used, but there is a 5 percent to 10 percent probability that Boca Grande or Key West, Florida, could be used as support bases. We take this to mean that no new support bases will be required for exploration activities resulting from the lease of OCS lands in the Gulf Region covered by this consultation, with the exception of the slight chance that Boca Grande and Key West might be used. Furthemore, it is assumed that all other types of facilities mentioned in this memorandum will be required only if development and production result from exploration in this Region.

It is also understood that the oilspill analysis provided for this consultation pertains only to the development and production phases on lands to be leased in the Region, plus the background of existing production along with the contributory effect of oil imported into the Gulf of Mexico. Therefore, as long as leasing and exploration activities utilize only existing onshore support facilities in the Gulf Region (not to include the use of Boca Grande and Key West, Florida), and as long as the probability of oilspills (of a magnitude large enough to be included in the oilspill analysis) occurring during the exploration phase is essentially zero, then it is my biological opinion that these activities are not likely to jeopardize the continued existence of the bald eagle, the brown pelican, the whooping crane, the loggerhead sea turtle, the Kemp's (=Atlantic) Ridley sea turtle, [the American crocodile,] and the West Indian (Florida) manatee or result in the destruction or adverse modification of the Critical Habitat of the whooping crane, [the American crocodile,] and the Florida manatee. However, should any additional onshore facilities be established along the Gulf Coast in support of exploration activities, particularly south of Tampa Bay, Florida (Port Manatee), then formal Section 7 consultation must be reinitiated. Such a request for consultation must include the following information:

(a) Location of the port to be used for operation;

(b) Routes or channels to be used by the vessels or aircraft and the relationships between these routes and listed species habitat or migration routes;

(c) Description of vessels to be used for support of OCS operations (design, speed, draft, and other pertinent information);

(d) Determinations of whether the vessels used for OCS oil and gas operations would have characteristics which would be more detrimental to manatees than those currently used in manatee habitat.

[(e) Refinement and update of oilspill risk analysis, with emphasis on southwest Florida.]

Even though the probability of one or more oilspills occurring and striking the southwest Florida coast is very small, our concern over the fragile nature of the Florida Bay area expressed in our April 1979 biological opinion continues. In this regard, we reiterate our statement about consulting on the establishment of any support bases along the coast south of Tampa Bay, Florida. We also advise extreme caution when considering any development plans that might feasibly contribute to an increased danger of oilspills in this south Florida area.

We also strongly recommend an investigation into the possible fate of oil from a spill once it is carried out of the Gulf around the southern tip of Florida by the Loop Current. Depending on the location of a spill and the existence and combination of wind and sea currents, it seems possible that oil from the Gulf might end up being deposited on the east coast of Florida under certain conditions.

In this opinion we have endeavored to address the direct (leasing and exploration of OCS lands) and indirect (oilspills and support facilities resulting from exploration) effects of the action as well as the interrelated (development and production phases, along with potential oilspills of the OCS program) and interdependent (pipelines, marine terminals, refinery, gas processing facilities, etc. that could result from development and production) aspects of the action. We have concluded that the direct and indirect actions are not likely to jeopardize the continued existence of the above listed species or result in the destruction or adverse modification of their Critical Habitats if the probability of oilspills from exploration are considered to be near zero and as long as existing support bases are sufficient to handle anticipated exploration activities. Consultation must be reinitiated if indirect actions (especially a need for new support bases) change or, if the interrelated and interdependent activities of development and production commence.

There remains for consideration, the cumulative effects of State and private actions in the Gulf Region that are reasonably certain to occur prior to completion of the Federal action which is the subject of this consultation. Since no specific information on such actions has been provided us by the Federal action agency to date, we reserve the right to make a supplementary comment on the potential effects of these projects (cumulative effects) after receiving a copy of the draft Environmental Impact Statement on this project.

The Minerals Management Service is reminded that Section 7 consultation must be reinitiated if new information reveals impacts on listed species or their habitats from this Federal project that were not considered in this opinion, if the proposed project is subsequently modified, or if a new species is listed or Critical Habitat is designated which may be affected by the proposed actions.

Attachment

Reference

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Fleming, W.J., L. Sileo, and J.C. Franson. 1982. Toxicity of Prudhoe Bay Crude Oil to Sandill Cranes. J. Wildl. Mgmt.: 46(2): 474-478.

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Pattee, O. and J.C. Franson. 1982. Short-term Effects of Oil Ingestion on American Kestrals (Falco sparverius). J. of Wildl. Diseases: 18(2): 235-241.

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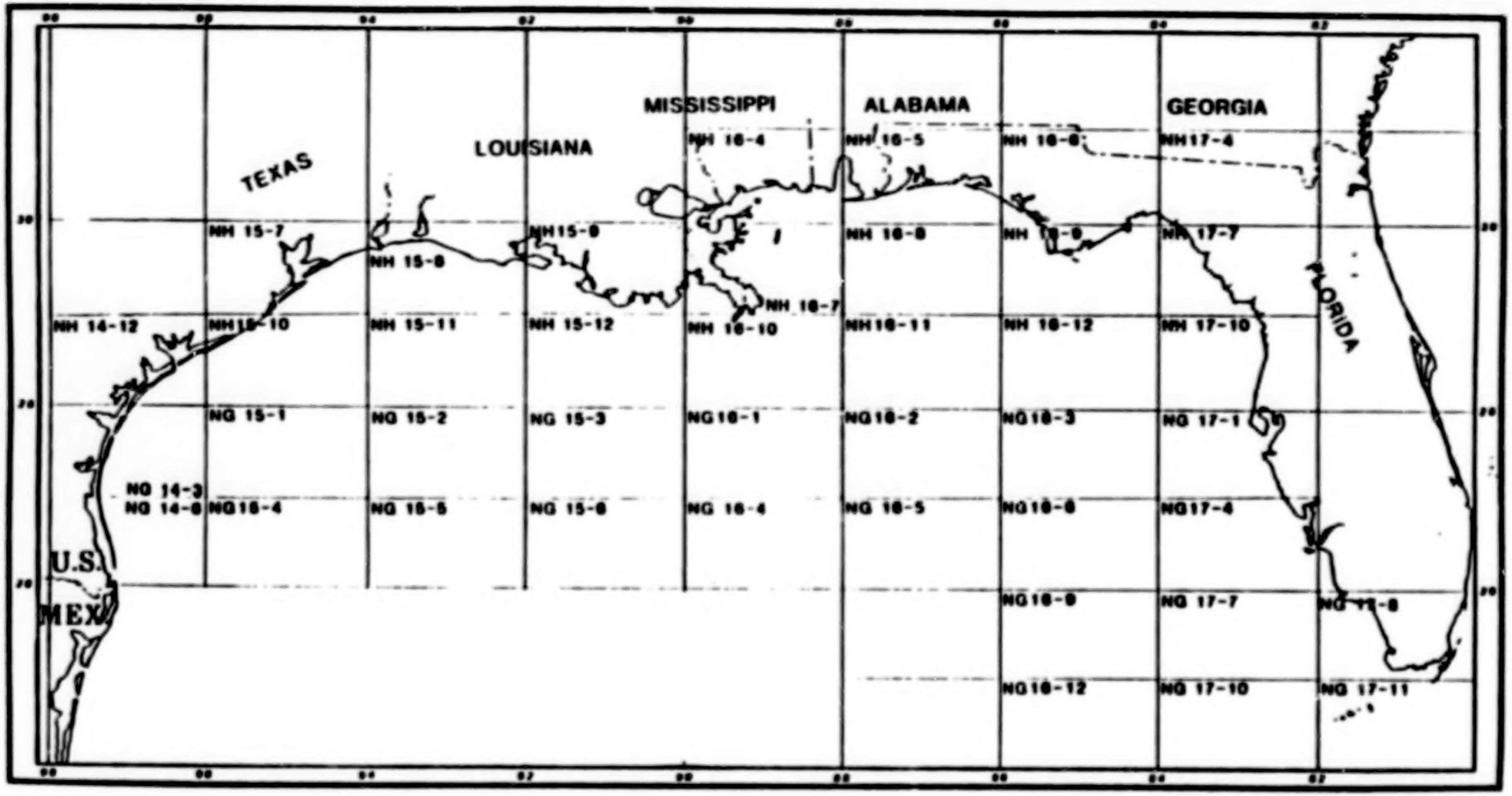

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Region
9450 Koger Boulevard
St. Petersburg, FL 33702

January 15, 1982 F/SER61:AM

Mr. John L. Rankin
Manager, Bureau of Land Management
New Orleans Outer Continental Shelf Office
Hale Boggs Federal Building
500 Camp Street, Suite 841
New Orleans, LA 70130-3373

Dear Mr. Rankin:

This responds to your December 21, 1981, letter requesting reinitiation of the Gulf of Mexico Regional Endangered Species Section 7 Consultation.

We have reviewed the information you sent. The material does not provide information that would alter the biological opinion we provided by letter of March 29, 1979, for oil and gas leasing in the entire Gulf of Mexico Outer Continental Shelf (OCS) oil and gas leasing areas. Accordingly, our March 29 opinion (copy enclosed) continues to apply.

Sincerely yours,

N.R. Ekberg
D. R. Ekberg
Chief, Environmental and
Technical Services Division

Enclosure

NEW ORLEANS OCS
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NATIONAL MARINE FISHERIES SERVICE
St. Petersburg, Florida
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MAR 29 1979

Mr. Donald P. Truesdell
Deputy Assistant Director
Department of the Interior
Bureau of Land Management
Washington, D.C. 20240

Dear Mr. Truesdell:

This letter is in response to your November 28, 1978, request for a formal consultation and to the January 30, 1979, request from Mr. J. R. Balsley, U.S. Geological Survey, for a joint consultation pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, regarding endangered and threatened whales and turtles in the entire Gulf of Mexico Outer Continental Shelf (OCS) oil and gas leasing areas. Enclosed is the biological opinion resulting from the consultation which states that the identified activities are not likely to jeopardize the continued existence of endangered and threatened species or result in the destruction or adverse modification of habitat critical to them.

The Bureau of Land Management should reinitiate consultation if new information becomes available on possible impacts of the proposed activities on endangered or threatened species or their habitats, if modifications are made in these activities, or if a new species is listed which may be affected by these activities.

We look forward to continued cooperation in future consultations.

Sincerely yours,

for Terry L. Leitzell
Assistant Administrator
for Fisheries

Enclosure

bcc: USGS-Balsley
cc: F, GCF, FSE, SWFC, FAK, NWAFC, FSW-Edmondsen, F6-Aron, GCF
(all w/enclosure)
F6:TRLoughlin:634-7461:3/20/79:pvt

10/4/79- Copy of Sec. 7 Threshold Exam. sent to [illegible], FSE 612.

F6-Aron BEST COPY AVAILABLE

ENDANGERED SPECIES ACT

Section 7 Consultation - Threshold Examination

Agencies: Bureau of Land Management (BLM) and U.S. Geological Surevey (USGS)

Activity: Gulf of Mexico lease sales, exploration, transportation, termination, development and production.

Consultation Conducted by: National Marine Fisheries Service.

Results of Threshold Examination:

Under Section 7 of the Endangered Species Act of 1973 (the "Act"), as amended, each Federal agency must ensure that any action authorized, funded, or carried out by such agency does not jeopardize an endangered or threatened species. Under the Section 7 consultation process established by the Act, the Secretary of Commerce is required to provide the Federal agency concerned an opinion detailing how the proposed agency action affects any threatened or endangered species within the Department's jurisdiction or the critical habitat of such species. In addition, the Secretary must suggest reasonable and prudent alternatives which would avoid jeopardizing the continued existence of such species or adversely modifying its critical habitat and which can be undertaken by the agency in implementing its action.

By letter of November 28, 1978, the Bureau of Land Management, Department of the Interior, requested initiation of a regional Section 7 consultation with the National Marine Fisheries Service on the Outer Continental Shelf oil and gas leasing program in the Gulf of Mexico.

As part of the consultation process, a meeting was held in New Orleans, Louisiana, on February 9, 1979 with representatives of the Bureau of Land Management, the U.S. Geological Survey, and the National Marine Fisheries Service.

Formal consultation was requested for the following species:

Humpback whale	Megaptera novaeangliae
Right whale	Eubalaena glacialis
Sei whale	Balaenoptera borealis
Blue whale	Balaenoptera musculus
Finback whale	Balaenoptera physalus
Sperm whale	Physeter catodon
Leatherback turtle	Dermochelys coriacea
Hawksbill turtle	Eretmochelys imbricata

Kemp's Ridley turtle	*Lepidochelys kempii*
Green turtle	*Chelonia mydas*
Loggerhead turtle	*Caretta caretta*

Eastern Gulf of Mexico:

These Federal actions involve the offering of 116 tracts for leasing for the extraction of oil and gas. The tracts are located on the Outer Continental Shelf in areas located west, south, and east of that portion of the states of Florida, Alabama, Mississippi, and Louisiana that border on the Gulf of Mexico. The largest portion of the proposed lease offering is located off the coast of Florida.

With two exceptions, each tract contains 5,760 acres (2331.04 hectares). Tract 65-32 contains 5454.72 acres and Tract 65-71 contains 5134.56 acres.

The total area offered in all tracts amounts to 667,229.28 acres (270,023.99 hectares). The tracts are located between 10 statute miles (16 kilometers) to 119 statute miles (190 kilometers) from shore. The water depths range from 60 feet (18 meters) to 1,150 feet (350 meters). Thirty-three of the tracts are located in areas where the water depth is equal to or greater than 200 meters.

Seventy-five of the tracts proposed for offering are believed to have potential for oil and gas production, and the remaining 41 tracts are believed to be potentially oil productive.

No commercial oil and gas production has been found on the Outer Continental Shelf in this region and no marine oil and gas production has been established in this portion of the Gulf of Mexico; therefore, no facilities for the production and transportation of crude and natural gas have been installed on the Outer Continental Shelf in the vicinity of the tracts proposed for leasing.

The U.S. Geological Survey estimates that between 15 and 150 million barrels of oil and 20 - 175 billion cubic feet of natural gas may be produced as a result of this proposed sale. The production rates may be estimated at between 2,500 and 24,000 barrels of oil per day and between 4 and 32 million cubic feet of gas per day. The daily rates are estimated as rates applicable to when development is complete and production stabilizes.

A. Exploration:

Following the awarding of leases, the successful bidders can be expected to drill exploratory wells in order to locate and delineate the areal extent of oil and gas deposits. The most likely number of exploratory wells to be drilled would be 75. These wells will probably be drilled by moveable offshore drilling units.

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B. Development and Production:

After the completion of exploratory drilling, platforms would be designed, constructed, and placed in position. Development wells will be drilled from platforms. The most likely number of platforms to be installed is 25, and the most likely number of development wells is 225. Underwater completions may also be utilized. Support facilities for this activity could be located in the Tampa, Panama City, or Mobile areas. The expected production life is 25 years.

C. Transportation:

The most likely method of transportation that will result from the proposed sale will be pipeline transportation of natural gas to shore points in the vicinity of existing onshore natural gas pipelines.

The most likely system for the transport of crude oil would be pipeline transport to onshore storage facilities and transportation from these terminals to existing refineries by surface marine transport. The most likely pipeline mileage that may be installed is 700 miles. Probable destination points and locations of oil terminal facilities and gas processing plants are the Manatee/Tampa area and the Mobile/Pensacola area.

A possible alternative gathering and transportation system could include the provision of offshore storage on the OCS and direct transportation from these facilities to existing refineries.

D. Termination:

Title 43, 3307.3-4 and 3307.3-6 provide for the removal of all structures when no longer required for operations. The removal must be completed within a period of one year following the expiration of the lease, and the structures must be removed to a sufficient depth beneath the surface of the waters to prevent them from being a hazard to navigation and the fishing industry.

OCS Order No. 3 requires that all casing and piling shall be severed and removed to at least 15 feet below the Gulf floor and the location shall be dragged to clear the well site of any obstructions.

This proposed action must be viewed as one part of a continuing activity that has been underway since the 1940's. Although primary emphasis has been placed on this particular sale, it should be put into the perspective of an on-going offshore oil and gas development process. As of June 23, 1977, there have been 34 OCS oil and gas (and five OCS sulfur and salt) lease sales on submerged lands in Federal areas of the Gulf of Mexico.

Currently, the Bureau of Land Management holds 495 permits on the OCS resulting in 3,862 miles of offshore pipelines. These figures are as of October 31, 1977, and exclude 12 pending applications.

As production declines in existing areas, much of the equipment, transportation facilities, and personnel can be used for new areas of activity. As existing areas of production decline, the pipelines in place can be used for new production areas, adjacent or further from shore, reducing the number of pipelines necessary to transport production from new areas to shore. This latter event has already been exercised in some areas of offshore Louisiana. Likewise, a reduction in quantity of onshore facilities, such as treatment plants, refineries, storage facilities, etc., is made possible by utilizing existing facilities, equipment, and technology.

Proposed OCS planning schedules are developed in order to project the timing, size, and location of specific sales for an OCS leasing program. The goal of the proposed schedule is to provide for orderly development of OCS oil and gas in order to maintain an adequate contribution of OCS production to the national supply and to provide early information concerning areas proposed for leasing activities.

Western and Central Gulf of Mexico:

These proposed lease sales would provide for the orderly and timely development of oil and gas reserves expected to occur on 115 tracts on the Outer Continental Shelf (OCS) in Federal waters in the Gulf of Mexico offshore of Texas, Louisiana, Mississippi and Alabama.

These tracts include approximately 545,255.24 acres and range from 3 to 165 nautical miles (6-189 kilometers) from shore in water depths of 6 to 500 meters. Approximately fifty-eight percent of these tracts are gas prone, four percent are oil prone, and thirty-eight percent are both oil and gas prone.

Surveys indicating seismic refraction, seismic reflection, gravity, magnetics, bright spot technology, and stratigraphic correlation are collected before and after leasing to assist in the determination, location, and magnitude of petroleum resources. Surface vessels of the 50 to 300 ton class are utilized to perform geophysical surveys. In general, seismic surveys record the behavior of shock waves through various rock formations. This information is used to determine the presence of salt domes, folds, faults and sediment thickness.

A. Exploration:

After a lease has been issued, shallow surveys defining geologic hazards, bottom stability, cultural resources and other conditions which might affect exploratory drill site locations are performed. Once a location has been selected, exploratory drilling begins. These drilling

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operations are basically the same regardless of the type of mobile rig utilized (jack-up rigs, drillships or semi-submersibles). Initially, a drive pipe is installed along with a blowout preventer. The actual drilling process involves the use of introduced muds which acts as lubricants, coolants, and pressure controls. Cuttings or a mixture of mud and drilled materials are a product of the drilling process. Sixty to 160 exploratory wells may be drilled as a result of this action.

B. Development and Production:

When petroleum discoveries are made and the extent of a field has been determined, a plan of development is devised. As a result, 10 to 25 multi-well platforms may be established with the drilling of 60 to 150 production wells.

The production phase of OCS oil and gas operations consists of bringing the product to the surface and preparing it for transport. This phase of the operation may go on for as long as 20 years. Formation waters of reservoir brines are produced in the oil and gas production process.

C. Transportation:

The principal means of getting gas and oil resources in the Gulf of Mexico from production areas offshore to processing and storage locations onshore has been and will continue to be via pipelines. Additionally, the labor force, equipment and supplies needed to service the various stages of offshore operations are transported by crewboats, barges and helicopters. As a result of this proposed action, 100 to 200 miles of new pipeline may be laid. These lines would run from new production facilities offshore and connect with the existing pipeline system to onshore facilities. It is anticipated that no new pipelines to facilities onshore will be required.

D. Termination:

When a reservoir has been depleted to a level at which it cannot produce profitably, operations are terminated. According to industry estimates, with proper placement of wells and sufficient pipeline capacity, a gas reservoir could be drained in as little as 10 years. In contrast, some oil reservoirs have been producing for over 20 years.

OCS orders issued by the U.S. Geological Survey require wells to be plugged, the casing severed adequately below the mudline, the platform removed, and all obstructions cleared from the area. Major trunklines may be used for future production from adjacent areas, but smaller lines would probably be abandoned in place. Abandonment of pipelines consists of flushing the lines of entrained hydrocarbons by water, disposing of the water onshore, and severing the ends below the mudline.

Endangered Species Impacts

Whales:

The posible impacts on whales and their critical habitat from exploratory and development/production activities were given thorough consideration. These included the following:

1. Seismic - It is the opinion of the Consultation Team that no unfavorable impacts would result from seismic operations.

2. Oil Spills - Conceivably, a large oil spill occurring in the immediate vicinity of whales could be harmful because of the possible intake of oil through the blow hole, fouling of the baleen plates, and indirectly from the ingestion of oil contaminated food. However, endangered cetaceans are uncommon in the lease/sale area and are sighted only on rare occasions. Therefore, even if an oil spill occurred in the tract areas, it is unlikely that any endangerd whales will be affected. In addition, there is no historical record of such an occurrence.

3. Boat traffic - Due to the migratory nature of whales, the small increase in boat traffic would have a minimal (non-measurable) impact.

Turtles:

The following exploratory and production/development activities were reviewed to determine possible impacts on sea turtles and their critical habitat:

1. Seismic - None.

2. Oil spills - The affect of oil spills is not known. However, oil ingestion or physical contact by turtles, especially with the eyes and nostrils and particularly in hatchlings entrapped in a spill, could be lethal. Hatchling and juvenile turtles are believed to be passively distributed by surface currents, the same mechanism that spreads oil. None of the five species of sea turtles that are found in the Gulf of Mexico occur in concentrated numbers of assemblages in those waters, and oil spills in limited areas would not be expected to impact on more than a few individuals at sea. Oil spills, however, could have severe impacts on nesting beaches if washed ashore at nesting seasons. Therefore, every effort to minimize the potential for spills should be exercised.

3. Boat traffic - As with whales, the small increase in boat traffic would have a minimal impact on sea turtles.

4. Drilling - Platforms and pipelines may increase habitat by creating "live-bottom" topography. Turtles have been observed to feed on sessile organisms attached to platforms. During the period from mid-

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summer to mid-fall, lights on drilling platforms near shore could attract hatchling turtles resulting in abnormal concentrations. These disoriented turtles would possibly be subjected to increased predation. It is recommended that monitoring of the effect of lights, particularly on hatchling loggerheads, be conducted to determine the significance of their impact.

Biological Determination and Need for Additional Information or Further Consultation:

After a careful review of the findings by the Consultation Team, it is my biological opinion that the proposed project is not likely to jeopardize the continued existence of the endangered or threatened species listed above or result in the destruction or adverse modification of habitats determined to be critical to them. This biological opinion is based on the general information in the EIS concerning possible effects of the proposed actions and does not relieve BLM or USGS of the continuing responsibility of reviewing their activities and programs in light of their Section 7 consultation should new information reveal impacts of the identified activities that may affect listed species or their habitats, or these activities are subsequently modified, or a new species is listed that may be affected.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Washington, D.C. 20235

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OS-

MAR 29 1979

Mr. Donald P. Truesdall
Deputy Assistant Director
Department of the Interior
Bureau of Land Management
Washington, D.C. 20240

Dear Mr. Truesdall:

This letter is in response to your November 28, 1978, request for a formal consultation and to the January 30, 1979, request from Mr. J. R. Balsley, U.S. Geological Survey, for a joint consultation pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, regarding endangered and threatened whales and turtles in the entire Gulf of Mexico Outer Continental Shelf (OCS) oil and gas leasing areas. Enclosed is the biological opinion resulting from the consultation which states that the identified activities are not likely to jeopardize the continued existence of endangered and threatened species or result in the destruction or adverse modification of habitat critical to them.

The Bureau of Land Management should reinitiate consultation if new information becomes available on possible impacts of the proposed activities on endangered or threatened species or their habitats, if modifications are made in these activities, or if a new species is listed which may be affected by these activities.

We look forward to continued cooperation in future consultations.

Sincerely yours,

Jack W. Gehringer
for Terry L. Leitzell
Assistant Administrator
for Fisheries

Enclosure

cc: Mr. James R. Balsley

NOTED
MAY 3 - 1979
R.A. DuPont

NOTED
MAY 1 1979
L.G. HAMMONS

NOTED—SOLANAS

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In Reply Refer To:
EGS-Mail Stop 630 [illegible]

Memorandum

To: Director, U.S. Fish and Wildlife Service

From: Director, Geological Survey

Subject: Section 7 Endangered Species Consultation request for Exploration Activities in the Gulf of Mexico OCS and the South Atlantic OCS

The U.S. Geological Survey would like to request a joint endangered species consultation on the Gulf of Mexico Outer Continental Shelf (OCS) and the South Atlantic OCS for exploration activities. It is our understanding, through a meeting with your staff, that the Bureau of Land Management (BLM) has also requested consultation on these areas for possible future leasing actions. A joint consultation would appear to measurably save the staff time of all Agencies involved.

We have discussed this request with BLM staff, and they do not have any objection to our requesting joint consultation. The consultation would cover future exploration activities in the Gulf of Mexico OCS and the items of concern to BLM. In addition, it would also cover consultation on the Loggerhead Sea Turtle and the Green Sea Turtle for exploration activities in the South Atlantic OCS area. It is our understanding that a meeting has been scheduled for February 6, 1979, in the BLM New Orleans OCS Office. Should this request for joint consultation meet your approval, our staff will be prepared to participate in that meeting.

[illegible]
Acting Director

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ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

In Reply Refer To:
FWS/OES 375.0

Memorandum

To: Director, Bureau of Land Management

From: Director

Subject: Section 7 Consultation - Regional Consultation for OCS Oil and Gas Leasing in the Gulf of Mexico

We have received your request for initiation of Section 7 Regional Consultation on the Outer Continental Shelf (OCS) oil and gas leasing program in the Gulf of Mexico.

Because of the complexity of the subject, I am appointing a Section 7 consultation team to carry out the consultation process with BLM. The following representatives are hereby appointed to the consultation team:

Robert Jacobsen - Office of Endangered Species
Nancy Sweeney - Office of Endangered Species
Jack Edmundson - Office of Endangered Species
Gary Halvorson - Region 2
Robert Cooke - Region 4
Jim Barkuloo - Region 4

The consultation team will meet with your representatives in the OCS Office in New Orleans, Louisiana, January 23, 1979, to begin the consultation process. Any questions concerning this matter may be directed to Nancy Sweeney, Office of Endangered Species (235-2760).

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American Crocodile

Crocodylus acutus

Key Deer

Odocoileus virginianus clavium

Eskimo Curlew

Numenius borealis

Everglade Kite

Rostrhamus sociabilis plumbeus

Cape Sable Sparrow

Ammospiza maritima mirabilis

Bachman's Warbler

Vermivora bachmanii

Kirtland's Warbler

Dendroica kirtlandii

Ivory - Billed Woodpecker·

Campephilus principalis

Schaus' Swallowtail Butterfly

Papilio aristodemus ponceanus

Bahaman Swallowtail Butterfly

Papilio andraemon bonhotei

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Red wolf	*Canis rufus*
Attwater's prairie chicken	*Tympanuchus cupido attwateri*
Red-cockaded woodpecker	*Dendrocopos borealis*
*American peregrine falcon	*Falco peregrinus anatum*
Artic peregrine falcon	*Falco peregrinus tundrius*
Whooping crane	*Grus americana*
Mississippi sandhill crane	*Grus canadensis pulla*
Brown pelican	*Pelecanus occidentalis*
Bald eagle	*Haliaeetus leucocephalus*
Kemp's Ridley turtle	*Lepidochelys kempii*
Hawksbill turtle	*Eretmochelys imbricata*
Leatherback turtle	*Dermochelys coriacea*
Green turtle	*Chelonia mydas*
Loggerhead turtle	*Caretta caretta*
American alligator	*Alligator mississippiensis*
West Indian manatee	*Trichechus manatus*

* This species has not been included in any previous consultation.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

IN REPLY REFER TO:
6840 (732)

NOV 28 1978

Memorandum

To: Director, Fish and Wildlife Service

Through: Assistant Secretary, Land and Water Resources

From: Director, Bureau of Land Management

Subject: Section 7 Endangered Species Consultation (OCS)

We are requesting a regional consultation on the Outer Continental Shelf (OCS) oil and gas leasing program in the Gulf of Mexico. In accordance with Section 7 of the Endangered Species Act we have requested formal consultation and received a biological opinion on each Gulf of Mexico lease sale. However, at this time we feel that a regional consultation on the entire Gulf of Mexico would be a more efficient approach.

Future oil and gas lease sales in the Gulf will take place in the same areas in which we have previously received biological opinions. This regional consultation should consider all of the ongoing operations pertaining to oil and gas leasing and the permitting of pipeline rights-of-way on the Federal OCS from Key West, Florida to Brownsville, Texas.

Enclosed is a list of the species for which we are requesting formal consultation. Except for the American peregrine falcon (Falco peregrinus anatum) all of these species have received a biological opinion from the previous site-specific consultation requests in the Gulf of Mexico.

We are enclosing a copy of the final environmental impact statement for the eastern Gulf (OCS Sale No. 65) and the central and western Gulf (OCS Sale No. 51) as reference material. Also enclosed is a copy of the request to the National Marine Fisheries Service.

Please send your comments to the New Orleans OCS Office, Bureau of Land Management, Hale Boggs Federal Building, Suite 841, 500 Camp Street, New Orleans, Louisiana 70130. If you have any questions concerning this matter, contact either Jake Lehman in the New Orleans OCS Office (FTS 682-6541) or William Van Horn in the Washington Office (343-6264).

[illegible]

Enclosures

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

In Reply Refer To:
FWS/OES 375.4

4/11/79

MEMORANDUM

To: Director, Bureau of Land Management & U.S. Geological Survey

From: Director

Subject: Biological Opinion Regarding Oil and Gas Leasing and Exploration Activities in the Gulf of Mexico

By memorandum received December 6, 1978, the Bureau of Land Management (BLM) requested formal consultation on a regional basis for the Gulf of Mexico oil and gas leasing activities (copy attached). At that time 16 species were included in the request. Through conversations with the BLM New Orleans OCS Office, ten species which could be affected were added to this list of species in order to include all the coastal Endangered and Threatened species found from Key West, Florida, to Brownsville, Texas.

In response to this request, I appointed a consultation team by memorandum of December 28, 1978, (copy attached) to assist me in determining whether leasing and exploration activities are likely to jeopardize the continued existence of the Endangered or Threatened species or result in the destruction or adverse modification of their Critical Habitat.

The team was comprised of Robert Jacobsen, Chief, Branch of Management Operations, Office of Endangered Species (OES); Nancy Sweeney, Team Leader, OES; Jack Edmundson, Team Leader, OES; Robert Cooke, Endangered Species Specialist (Region 4, Atlanta, Georgia); Jim Baker, Endangered Species Biologist (Region 4, Jacksonville, Florida); and Jim Barkuloo, Coastal Ecosystems Specialist (Region 4, Panama City, Florida).

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On January 30, 1979, the U.S. Geological Survey (GS) requested the inclusion of exploration activities in the regional Gulf consultation initiated by BLM on leasing activities (copy attached). Since exploration plans must be approved or disapproved within 30 days, the Fish and Wildlife Service (FWS) has insufficient time to consult on each exploration plan. The GS and FWS held a meeting on January 19, 1979, to discuss this issue. It was later decided, with the concurrence of BLM, that a combined consultation would be held for the Gulf of Mexico. Therefore, this consultation includes both BLM leasing and GS exploration activities for the Gulf.

On February 6 and 7, 1979, the consultation team met with BLM and GS representatives to discuss the leasing and exploration activities in the Gulf of Mexico. A list of participants is attached.

The consultation team reviewed reports, publications, and correspondence from knowledgeable sources on the species in question, and in addition, numerous telephone contacts were made with other experts. Information contained in Final Environmental Impact Statements (FEIS) for OCS Sales 51 and 65, western and central Gulf and eastern Gulf of Mexico, respectively, was carefully evaluated to ascertain the effects of the leasing and exploration activities. Copies of pertinent records and documents are included in an administrative record maintained at the Office of Endangered Species and are incorporated by reference.

Project Description

The BLM acts as agent for the Secretary, Department of Interior, in processing bids on the advertised lease sales. After issuance of the leases, primary regulatory authority for exploration, development, and production of the lease tracts shifts to GS and other Federal agencies.

Exploration of the OCS requires certain onshore support facilities including office space, helicopter and fixed-wing aircraft facilities, docks for boating activities, and supply bases. Due to the uncertain nature of oil exploration, companies are generally unwilling to construct new facilities to support this operation. They prefer instead to utilize existing areas and facilities.

At the present, there are numerous onshore facilities throughout the Gulf of Mexico being used for exploration activities. Should the use of these facilities be changed or additional onshore facilities be needed which may affect listed species or their habitats, consultation must be reinitiated. This biological opinion is based on two assumptions; that existing onshore facilities will be utilized and that the probability of an oil spill occurring, or reaching the species or habitat during exploration activities, is minimal.

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Should exploration activities reveal the presence of significant amounts of hydrocarbons, development and production activities will take place. During these activites, new onshore facilities will be constructed when needed; barges and tankers will transport oil until necessary pipelines are installed, and oil spillage will occur. The development and production activities may affect Threatened and Endangered species, therefore, Section 7 consultation will be required. This biological opinion considers the leasing and exploration activities which may occur within the Gulf of Mexico provided that new facilities or patterns of use are not initiated. Development and production phases (referred to as development/production throughout this opinion) are not included in this opinion.

A summary of the biological data and considerations of the consultation team are provided for all 25 species.

Red Wolf (*Canis rufus*)

The red wolf was originally listed as Endangered in the *Federal Register* on October 13, 1970. Today, the only genetically pure population not in captivity may be found along the Gulf coast in Chambers and Jefferson Counties, Texas, and in Cameron and Vermilion Parishes, Louisiana.

Habitat for the red wolf is generally limited to coastal areas consisting of marshlands and coastal prairies, pine hardwood forests with heavy brush understory, and old fields overgrown with tall grasses and bushes. To date, Critical Habitat has not been determined for this species. The red wolf feeds primarily on rabbits, nutria, rodents, marsh birds, waterfowl, crabs, and carrion.

Several factors are known to be contributing to the decline of the red wolf, including: interbreeding with coyotes, urbanization, industrialization, hunting, trapping, and parasitism.

It is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of this species. However, any activity or program authorized, funded, or carried out by a Federal agency which may affect the Endangered red wolf or its habitat, particularly any new onshore facilities related to exploration and development/production activities of the lease areas, will require Section 7 consultation.

Attwater's Prairie Chicken (*Tympanuchus cupido attwateri*)

Attwater's prairie chicken was listed as an Endangered species in the *Federal Register* on March 11, 1967. Approximately 1,500 individuals of this species remain in local colonies on the mid-Texas coast. Coastal prairie is considered

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an essential habitat component. Cord grass (*Spartina spartinae*) prairie is also capable of supporting prairie chickens where it is interlaced with knolls and ridges of better-drained ground. Prairie chickens can also live in favorable combinations of native prairie, pasture, and cultivated lands. Seed and seed pods of such plants as ruellia, stargrass, bedstraw, doveweed, and perennial ragweed are important food items.

Reduction of coastal prairie habitat has been an important factor leading to the decline of this species. In 1967 it was estimated that the species occupied 234,000 acres whereas today, it is estimated that 170,000 acres support the species. Based upon pending or planned conversion of coastal prairie, a further 16 percent reduction of supportable habitat will occur by the mid-1980's. Grazing, urban development, and hurricanes have also been associated with this decline. The reduction of viable prairie chicken habitat is resulting in the isolation of prairie chickens into small populations that are more susceptible to local extirpation.

Impacts from offshore leasing and exploration would be associated with the onshore development which could cause habitat destruction or disturbance of breeding and nesting activities. Since existing onshore facilities will be utilized during the exploration phase, it is my biological opinion that the leasing and exploration activities are not likely to jeopardize the continued existence of the species nor adversely modify habitat essential for its survival. However, any activity or program authorized, funded, or carried out by a Federal agency which may affect this species, particularly onshore facility proposals and proposed development/production activities, will require Section 7 consultation.

Arctic Peregrine Falcon (*Falco peregrinus tundrius*)

The Arctic peregrine falcon was listed as an Endangered species in the *Federal Register* on October 13, 1970. The bird is a medium sized falcon which is listed as Endangered in Canada, the United States, and Mexico. Critical Habitat has not yet been determined for this subspecies.

This subspecies breeds in the North American tundra and winters along the Gulf coast from Florida, west to the eastern Mexican coast and Baja California, south to mid-Chile and mid-Argentina, and possibly on Pacific Islands.

Field and laboratory evidence indicates that the decline of peregrine populations is generally due to the presence of chlorinated hydrocarbon pesticides in the falcon's food supply. This leads to reproductive failure through eggshell thinning and non-viable eggs, as well as, increased adult mortality. Other factors which may cause local decreases in reproductive success are human disturbance and adverse weather conditions during nesting.

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Essential habitat for the Arctic peregrine includes preferred breeding areas near rivers, lakes, or the sea in the Arctic tundra, where nesting sites include cliffs, dykes, cutbanks, and occasionally boulders, hummocks, or the ground. While the Arctic peregrine migrates south through a broad area of eastern and middle North America to the Gulf coast, it funnels into coastal areas and concentrates along the beaches and barrier islands.

The Arctic peregrine feeds mostly on a wide variety of birds and occasionally on small mammals. Peregrines will kill oiled birds and in doing so, ingest considerable numbers of feathers with their meal. The impact of this ingested oil is unknown.

The possible impacts on Arctic peregrines from OCS leasing and exploration include the contamination of the peregrines' food sources and disruption of habitat along their migration route. Existing onshore facilities will be utilized for exploration, and the possibility of an oil spill during exploration activities is minimal. Therefore, it is my biological opinion that the leasing and exploration activities are not likely to jeopardize the continued existence of the Arctic peregrine. However, any onshore activities requiring new facilities or any activity or program, authorized, funded, or carried out by a Federal agency which may affect the Arctic peregrine or its habitat, including proposed development/production activities, will require Section 7 consultation.

Red-Cockaded Woodpecker (*Picoides* (=*Dendrocopos*) *borealis*)

The red-cockaded woodpecker was listed as an Endangered species in the *Federal Register* on October 13, 1970. Recent literature indicates the species is presently decreasing in numbers and its populations are being fragmented by habitat loss.

The historic range of this non-migratory species includes the southeastern United States as far west as east Texas and southeastern Oklahoma, as far north as southern Missouri, southcentral Kentucky, and southeastern Maryland, and as far south as Long Pine Key in the Florida Keys. Their present distribution is thought to be similar to the above delineated range except that the extreme limits have contracted to some extent. More importantly, within the species range, its populations are becoming increasingly fragmented.

In all parts of its range, the red-cockaded woodpecker is found primarily in mature, open pine forests. The cavity trees are always living pine trees and usually over 60 years old with red-heart disease. The diet of the red-cockaded woodpecker is primarily arthropods and seasonally available fruits. Stomach analysis indicates that food consumption is about 81 percent insects and 19 percent vegetable matter.

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The decline of this species has generally been attributed to habitat loss resulting from widespread changes in forest management practices over the past 25 years. Increased demands from the pulping industry, along with a general trends toward shorter timber rotations, has in many areas precluded the pine stands over 60 years old necessary for this species.

With the use of existing onshore facilities for exploration activities, it is my biological opinion that the leasing and exploration activities are not likely to jeopardize the continued existence of the species. However, any activity or program authorized, funded, or carried out by a Federal agency which may affect the red-cockaded woodpecker, particularly any proposed onshore facilities related to oil and gas exploration or development/production activities, will require Section 7 consultation.

Whooping Crane (Grus americana)

The whooping crane was originally listed as Endangered on March 11, 1967. Its wild breeding population nests in Wood Buffalo National Park, Northwest Territories, Canada, and winters from October to April on and adjacent to the Aransas National Wildlife Refuge in the Texas Gulf coastal areas.

Their migratory range includes the Canadian Provinces of the Northwest Territories, Alberta, Saskatchewan, Manitoba, and the States of Montana, North and South Dakota, Nebraska, Kansas, Oklahoma, and Texas. Critical Habitat has been determined for a portion of their migratory route and winter range and was published in the Federal Register on May 15, 1978.

The total population numbers a little over 100, though the wild Texas population as of January 1979 numbered 74. This represents an increase over the 15 known birds reported in 1939 and may be indicative of a continuing expansion of the whooping crane population.

Parents and young-of-the-year remain together as family units for nearly a year, separating on their return trip back to their muskeg nesting areas in Canada. Tidal salt flats, including ponds and estuaries, are typical winter habitat. On their wintering area in Texas, their preferred foods include blue and fiddler crabs, clams and mudshrimp from tidal areas, frogs, crayfish, and snails from freshwater ponds.

Factors which contributed to the decline of the whooping crane include the loss of habitat, overutilization of the species, and a low reproductive potential.

Since the whooping crane's major winter food items are aquatic organisms, an oil spill could prove harmful to the species. The whoopers feed in water by probing into mud. Further, its wading habits (on occasion they may be

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submerged up to their shoulders) could result in oil coating its feathers in the event of an oil spill. And lastly, ingestion of oil coated prey may be adverse to the individual bird's well-being and reproductive capability and could prove harmful to the species.

Since the probability of an oil spill occurring during exploration activities is minimal and existing facilities will be utilized, it is my biological opinion that the leasing and exploration activities are not likely to jeopardize the continued existence of the whooping crane or destroy or adversely modify its Critical Habitat. GS should continue to place aircraft height restrictions on the helicopter and fixed-wing aircraft traffic around the whooping crane's winter Critical Habitat on and adjacent to the Aransas National Wildlife Refuge from October to April. Furthermore, should any onshore activities requiring any Federal action be proposed for the area between Port Aransas and Port O'Connor that would affect the whooper environment, Section 7 consultation will be required. Additionally, any activity or program authorized, funded, or carried out by a Federal agency which may affect the whooping crane, especially nearshore or onshore pipelines associated with development/production activities, Section 7 consultation will be required.

Mississippi Sandhill Crane (Grus canadensis pulla)

Records indicate that the Mississippi sandhill crane was probably never very common. It is presently restricted to a relatively small area in Jackson County, Mississippi. The species was classified as Endangered on June 4, 1973, and its Critical Habitat was promulgated in the August 8, 1977, Federal Register. Present population estimates range from 30 to 50 individuals.

The species is non-migratory and has established fairly restricted nesting, feeding, and winter roosting areas. Nesting is normally limited to the semi-open, wet, savanna areas within its range. All known current nesting occurs within the Critical Habitat area with the exception of one nest approximately 8 miles north of this area. Feeding is generally limited to the wet savanna or marsh and agricultural fields and pastures. Their diet is varied and includes insects, aquatic animals, and plant material, including roots and tubers and grain from agricultural fields. Winter roosting areas have been identified within the Pascagoula River swamp area east of the nesting area.

The current status of the species is attributed to habitat loss which has occurred from land drainage and other land use practices. Drainage projects have increased the potential for both commercial development and the conversion of many acres into pine plantations. Other land changes are associated with the present grazing laws. Previous open range laws have prompted the use of fire to maintain grazing conditions. Recent closed grazing laws, however, in addition to increased pine plantations, have generally precluded the use of fire in most areas.

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It is my biological opinion that impacts relative to the leasing and exploration activities are not likely to jeopardize the continued existence of the Endangered Mississippi sandhill crane or result in adverse modification or destruction of its Critical Habitat. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly those related to development/production activities of the lease areas, which may affect the Endangered Mississippi sandhill crane or its Critical Habitat, will require Section 7 consultation.

Brown Pelican (Pelecanus occidentalis)

The brown pelican was originally listed as Endangered on October 13, 1970. The bird normally ranges on the eastern seaboard from North Carolina to Florida and around the Gulf coast to Texas and Mexico, southward to Venezuela, as well as the West Indies and Islands of the Caribbean. Within the United States a small population of about 50 individuals exists in Texas and is increasing slowly. Louisiana populations are those restocked from Florida since 1968, plus offspring from these birds. This new Louisiana population suffered a decline of approximately 40 percent in 1975 and now numbers about 200 birds. Both Carolina populations are relatively small and nearly stable. In Florida a stable population of 20,000 - 30,000 is reported. Critical Habitat has not yet been determined for this species.

The habitat of these colonial nesters is small coastal islands in salt and brackish waters. Nests are constructed from available vegetation. The major food of the pelican is fish, including menhaden, mullet, sardines, and pinfish. The pelican catches these fish by plunge-diving in coastal waters. Brown pelicans are rarely found away from saltwater and typically do not venture more than 20 miles (32 km) out to sea. Extensive use of pesticides which were ultimately ingested by the brown pelican has been noted as the primary cause of the current population decline of the species.

Pelicans may be susceptible to oil spills. As brown pelicans dive for fish, their entire body can be coated with oil. This may contribute to direct mortality or could result in a secondary impact in reduced hatchability of eggs that may become oiled by a contaminated adult bird.

The brown pelican is extremely susceptible to disturbance and habitat alteration of key nesting areas. It is imperative to prevent disturbance of nesting colonies that could cause nest desertion and egg losses.

Since existing onshore facilities will be utilized, and the possibility of an oil spill occurring from exploration activities is minimal, it is my biological opinion that the leasing and exploration activities are not

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likely to jeopardize the continued existence of the species. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly those related to proposed onshore facilities and development/production related activities, will require Section 7 consultation.

Bald Eagle (Haliaeetus leucocephalus)

The bald eagle was initially considered to have two distinct subspecies when the southern bald eagle was listed as an Endangered species in the Federal Register of March 11, 1967. The entire species was listed as Endangered in 43 of the conterminous 48 States and Threatened in the remaining five States on February 14, 1978. The bald eagle populations occurring within the area which may be impacted by this proposal are listed as Endangered.

In the Southeast, bald eagles actively nest in South Carolina, Florida, Mississippi, Louisiana, and Texas. Suitable habitat appears to be available in North Carolina, Georgia, and Alabama but there is no known nesting activity in these States. Nesting occurs from November to April in the Gulf coast area.

Florida had at least 319 active nesting territories distributed throughout most of the State during the 1977-78 nesting season. The west coast counties of Florida have a large number of active bald eagle nesting territories. With the exception of Dixie and Jefferson Counties, each county from Franklin east and south along the Gulf has nesting bald eagles. Concentrations of nesting territories are from the Waccasassa River to Tampa Bay and from Englewood through Florida Bay.

The only known active nest in Mississippi is in Harrison County. The nest is inland and within visual distance of Interstate 10. There were nine reported active territories in Louisiana during the 1977-78 nesting season, located primarily in the coastal parishes. Approximately 8 to 11 breeding pairs of eagles are located in Goliad, Refugio, Calhoun, Victoria, Matagorda, Brazoria, Orange, and Trinity Counties in Texas.

Eagles are opportunistic feeders, with fish constituting the bulk of their diet. They will also feed on waterfowl and shorebirds, particularly sick or injured individuals, as well as carrion. Throughout most of the bald eagle's range, its population decline has been largely attributed to the effect of pesticide ingestion (which resulted in eggshell thinning) and indiscriminate shooting of both immature and adult birds. Florida appears to be an exception, where the primary factors at this time are loss of habitat through urbanization.

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The two potential sources of impact to the eagle from leasing and exploration activities are disturbance to its nests, resulting from development of onshore facilities, and the possibility of an oil spill reaching the coast and contaminating the food source of the eagle.

Since the onshore facilities for leasing and exploration activities will be those already in existence and the possibility of an oil spill occurring during exploration activities is minimal, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the bald eagle. However, any activity or program authorized, funded, or carried out by a Federal agency, especially development/production activities, which may affect bald eagles or active nesting sites, will require Section 7 consultation.

Sea Turtles

Populations of the listed sea turtles have declined due to commercial overutilization of eggs and turtles, increased natural predation on eggs and hatchlings, incidental catches by commercial fishermen, and possibly littering of the seas (plastic bags give the appearance of jellyfish and can kill if consumed).

Sea turtle nesting habitat may be impacted by oil spills and human disturbance resulting from OCS activities. Disturbance by development and other human use of beaches is incompatible with successful sea turtle nesting. Sea turtles hatch at night and move toward the brighest light, which normally would be the moon reflecting on the ocean. Bright lights in the nesting beach areas could disorient this migration, rendering the young turtles vulnerable to road traffic or predators.

The National Marine Fisheries Service (NMFS) has jurisdiction over Endangered sea turtles while they are in the aquatic environment. When the turtles are onshore they are under the jurisdiction of FWS. Therefore, the following information on five sea turtles relates to impacts of leasing and exploration activities on onshore turtle habitat.

The effect of development/production activities on sea turtles is not included as those phases are not being consulted on at this time. It should be noted, however, that we are currently unaware of the existence of much information concerning the effect of oil spills on nesting sea turtles and their habitats.

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Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)

The Kemp's ridley sea turtle was originally listed as Endangered on December 2, 1970. The adult turtle is found only in the Gulf of Mexico. Immature ridleys also occur along the Atlantic coast as far north as Massachusetts and are sighted infrequently along European shores. The essential habitat of the Kemp's ridley includes shallow coastal and estuarine waters often associated with subtropical shorelines of red mangrove. In the United States, this species is believed to sporadically nest in Kleberg, Kenedy, Willacy, and Cameron Counties, Texas. The entire population now nests primarily on approximately 14 miles (24 km) of beach in the State of Tamaulipas, Mexico. Nesting female population estimates for 1947 were 40,000; 2,000 to 4,000 in 1973; 400 to 500 in 1976; and approximately 300 in 1978. Currently, there exists an international project to reestablish a viable breeding population on Padre Island National Seashore. In 1978, turtle eggs were collected in Mexico and hatched and imprinted in the United States.

Portunid crabs (*Callinectes* spp.) make up a large portion of the turtle's diet. These turtles also feed on other crabs, shrimp, snails, echinoderms, medusae, and fish. The northern Gulf off the coast of Louisiana has been identified as a major feeding area.

Although the Kemp's ridley sporadically nests on Padre Island and is believed to nest on the beaches of Kleberg, Kenedy, Willacy, and Cameron Counties on the Texas Gulf coast, it is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of the Kemp's ridley sea turtle. This is due to the minimal likelihood of an oil spill occurring during exploration activities, and that existing onshore facilities will be utilized. Should additional onshore facilities or a change in the use of the existing facilities be proposed, Section 7 consultation will be required. Additionally, any activity or program authorized, funded, or carried out by a Federal agency, particularly development/production activities, which may affect the nesting sites of the Kemp's ridley, will require Section 7 consultation.

Hawksbill Sea Turtle (*Eretmochelys imbricata*)

The hawksbill turtle was originally listed as Endangered on June 2, 1970. The distribution of the hawksbill in the Atlantic Ocean extends from southern Brazil to Massachusetts. Nesting occurs on scattered islands and shores generally between 25 degrees north and south latitude. In the conterminous United States there have been only two reported nestings in Florida.

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Hawksbills frequent rocky areas, reefs, shallow coastal areas, lagoons of oceanic islands, and narrow creeks and passes, and are generally found in water less than 20 meters deep. Hatchlings are often found floating in masses of sea plants. Nesting is at random, probably without established nesting sites, usually on undisturbed deep-sand beaches in the tropics.

The hawksbill feeds on the bottom and forages close to shores and reefs. It is omnivorous although it prefers invertebrates.

Population estimates are not available. Although the former distribution was probably equal to the present, population numbers have declined considerably. Many nesting beaches have been abandoned due to natural disasters (such as hurricanes and erosion), alteration of habitat, or commercial utilization by man.

It is my biological opinion that since the hawksbill turtle is not known to nest on the beaches in the Gulf of Mexico, the leasing and exploration of OCS lands are not likely to jeopardize the continued existence of the hawksbill turtle or destroy or adversely modify nesting habitat essential to its survival and recovery.

Leatherback Sea Turtle (Dermochelys coriacea)

The leatherback turtle was originally listed as Endangered on December 2, 1970. Critical Habitat in the Virgin Islands has been determined and was published in the Federal Register on September 26, 1978. The distribution of the leatherback is worldwide, consisting of tropical Atlantic, Pacific, and Indian Oceans. It is also found in small numbers in waters as far north as British Columbia, Newfoundland, the British Isles, and as far south as Australia, Cape of Good Hope, and Argentina. The leatherback has also been sighted in the Mediterranean Sea. It was formerly more widely distributed in the Mediterranean, Atlantic, Pacific, and Indian Oceans. The major nesting beaches are in Malaysia, Surinam, French Guiana, Mexico, Costa Rica, and South Africa.

Although one nest was reported to have occurred in 1966 in North Carolina, nesting in the United States is usually restricted to Florida. Atlantic coast nests have been recorded from Flagler Beach to Miami with the majority of records from Palm Beach and Martin Counties. There appears to be a small population that nests regularly on Hutchinson Island, Martin County. On the Gulf coast, sightings are common in March and April. Nesting has been reported on the Florida Gulf coast.

The most pelagic of the sea turtles, the leatherback may often be found near the edge of the continental shelf. In northern waters they occasionally enter shallow estuarine bays.

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The leatherback is an omnivorous turtle. Its preferred food is jellyfish, but it also consumes sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed.

Since the leasing and exploration activities in the Gulf of Mexico will use existing onshore facilities, and the likelihood of an oil spill resulting from exploration activities is minimal, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the leatherback turtle. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly additional onshore facilities for exploration activities and development/production proposals, will require Section 7 consultation.

Green Sea Turtle (Chelonia mydas)

The green sea turtle was listed as Threatened in the Federal Register on July 28, 1978, in all of its eastern North American range except the State waters of Florida, where it is Endangered. Critical Habitat has not yet been determined.

This turtle has a broad, heart-shaped shell and small head, and is found throughout the world in tropical and semi-tropical waters. In eastern North America it is found from the coasts of Massachusetts to Mexico. The known United States nesting is limited to southern Florida beaches. Nesting on the east coast ranges from Cape Canaveral National Seashore southward with concentrations located on Merritt, Hutchinson, and Jupiter Islands, and Hobe Sound National Wildlife Refuge; and on the west coast from Marco Island to the Florida Keys. Favored habitat appears to be lagoons and shoals with an abundance of marine grass and algae. Adult green turtles are primarily herbivorous, although mollusks and crustaceans are also eaten. Immature green turtles are more omnivorous than adults in their feeding habits.

Since the leasing and exploration activities will utilize existing onshore facilities, and the possibilty of an oil spill occurring during exploration activities is minimal, it is my biological opinion that these activites are not likely to jeopardize the continued existence of the green turtle. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly additional onshore facilities and development/production proposals, will require Section 7 consultation.

Loggerhead Turtle (Caretta caretta)

The loggerhead sea turtle was listed as Threatened in the Federal Register on July 28, 1978. The loggerhead is a large sea turtle weighing up to 300 pounds and occurs on the east coast of North and South America from Newfoundland to Argentina and in the Canary Islands. The loggerhead wanders widely throughout

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the marine waters of its range and has been found as far as 500 miles out in the open sea. Nesting occurs on various barrier islands and beaches from Chincoteague National Wildlife Refuge, Virginia, south to the Florida Keys on the east coast. In the Gulf of Mexico, loggerheads nest on various barrier islands and beaches throughout the Keys and up the Florida west coast to the Chandelier Islands, Louisiana. The loggerhead feeds primarily on shellfish. They will also feed on fish, sponges, jellyfish, and marine grasses.

Since the leasing and exploration activities will utilize existing facilities, and the possibility of an oil spill occurring during exploration activities is minimal, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the loggerhead. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly additional onshore facilities and development/production proposals, will require Section 7 consultation.

American Alligator (Alligator mississippiensis)

The American alligator was originally listed as Endangered on March 11, 1967, and subsequently was reclassified as Threatened (similarity of appearance) in Cameron, Vermilion and Calcasieu Parishes in Louisiana in the Federal Register on September 26, 1975. It was reclassified as Threatened in the wild in Florida and in certain areas of Georgia, Louisiana (except in Cameron, Vermilion, and Calcasieu Parishes), South Carolina, and Texas in the Federal Register on January 10, 1977. The distribution of the alligator in the United States extends from North Carolina to south Florida and the Gulf coast states and inland to Oklahoma and Arkansas. Critical Habitat has not yet been determined for the alligator. The alligator prefers fresh water but can tolerate different levels of salinity, and in coastal areas it can adapt to brackish water. The alligator prefers marsh areas but is found in small ponds, creeks, man-made canals, rivers, streams, and estuarine bays. The alligator preys chiefly on vertebrates such as fish, frogs, turtles, and nutria. Available carrion is also eaten.

The alligator was listed primarily because of commercial overharvesting and habitat loss. The alligator has recovered to a Threatened status in the coastal areas of Texas, South Carolina, Georgia, Louisiana, and Florida.

Two potential impacts from exploration activities are recognized. One is that oil could contaminate the alligator's food source. However, the effects of ingested oil on the alligator is not known at this time. The other impact would occur if onshore development decreased the suitable habitat necessary for the survival and recovery of the alligator.

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Since the leasing and exploration activities will utilize existing facilities, and the possibility of an oil spill occurring during exploration activities is minimal, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the American alligator. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly related to onshore activities of expanded exploration and proposed development/ production activities, will require Section 7 consultation.

Florida Manatee (Trichechus manatus)

The Florida manatee was originally listed as Endangered on March 11, 1967. Historically, the range of the manatee in the United States was from New Jersey to southern Texas, with an estimated population of several thousand individuals. The present range of the species in the United States is from North Carolina to Louisiana. The present estimated population is 750 to 900 animals, mostly concentrated in Florida.

The manatee is apparently migratory. During the winter months when the water temperature to the north drops below 21°C, manatees concentrate on the coast of peninsular Florida from the Crystal River (west coast) around the Florida peninsula to Titusville (east coast), and from Jacksonville south in the St. Johns River. During the summer months the population disperses along the coast.

Critical Habitat for this species has been determined and was published in the Federal Register on September 24, 1976. It includes portions of the Florida Gulf coast in Hillsborough, Manatee, Sarasota, Charlotte, Lee, Collier, and Monroe Counties. The manatee is an aquatic herbivore feeding on submergent, emergent, and floating plants apparently in that order of preference.

Initial population decreases resulted from commercial overharvesting for meat, oil, and leather, but the primary reason for the current Endangered status of the Florida manatee is attributed to mortality from accidental collisions with boats and barges. However, malicious killings do occur to an unknown degree. Actual physical habitat loss is of secondary importance, but the impact of increased boat traffic on manatee habitat is considered serious.

Because of the increasing recreational boating activities, increased support boat traffic for dredging, and existing commercial boat traffic, it is my biological opinion that boating activities between Cedar Key and Key West, Florida resulting from OCS leasing and exploration, with possible development (should significant quantities of oil and gas be discovered), are likely to jeopardize the continued existence of the Florida manatee and to adversely modify its Critical Habitat. It is my belief that the use of Tampa/Port Manatee as the support base for exploration activities resulting from OCS lease sales on the west Florida shelf would avoid jeopardizing the manatee or

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adversely modifying the manatee's Critical Habitat even though this port is adjacent to the designated Critical Habitat of the manatee, because impacts are expected to be minimal when boating activities are restricted to the deeper ship channels from Egmont Channel to Port Manatee. Any OCS oil and gas activities resulting from OCS lease sales which anticipate the use of bases of operation between Cedar Key and Key West, with the exception of Tampa/Port Manatee, may affect the manatee and will require Section 7 consultation. Requests for consultation must include the following information:

a. Location of the port to be used for operations;

b. Routes or channels to be used by the vessels and the relationship between these routes and manatee habitat or migration routes;

c. Description of vessels to be used for support of OCS operations (design, speed, draft, and other pertinent information);

d. Determination of whether the vessels used for OCS oil and gas operations have characteristics which would be more detrimental to manatees than those currently used in manatee habitat.

American Crocodile (Crocodylus acutus)

The American crocodile was listed as Endangered in the Federal Register on September 25, 1975. Critical Habitat was designated in the Federal Register on September 24, 1976. The crocodile lives only in southern Florida where estimates of the present population range from 200-400 individuals.

They breed only in southern portions of Everglades National Park, chiefly along Florida Bay, and on adjacent Key Largo. Another population is reported from the Lower Florida Keys on Big Pine, Little Pine, and Howe Pine with breeding rumored on Little Pine Key. Individuals have been reported in Biscayne Bay on the east coast of Florida and Marco Island and Charlotte Harbor on the west coast.

The decline of the crocodile is due to habitat loss from the increased urbanization of south Florida and from the increased human recreational use of the area. Mortality due to commercial fishing nets and automobiles, as well as malicious killings by uninformed people, have all contributed to the decline of the American crocodile.

The crocodile utilizes coastal areas and inhabits more saline areas than alligators. Adults feed primarily on fish and the young on aquatic invertebrates. Nest construction begins in April, egg laying in April

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or May, with the hatch occurring in July and August. Although the ritualistic nesting requirements are not thoroughly understood, it is felt that nest disruption from human disturbance during the incubation and hatching period could be a critical factor.

There have been only a few exploratory wells drilled south of Naples, Florida. Due to the American crocodile's narrow geographical range, low numbers, and coastal habitat, it is an extremely sensitive species. Although the direct effects of oil on the crocodile are not known, an oil spill which reaches the coastal area could contaminate their food source.

Because of the minimal possibility of an oil spill occurring during exploration activities, and the anticipated use of existing onshore facilities, it is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of the American crocodile or destroy or adversely modify the Critical Habitat of the species. However, if a significant amount of oil and gas are found during exploration, development/production will follow. Any development/production activities occurring in or near the Cape Sable/Florida Bay area will require Section 7 consultation. At that time, further information will be necessary to determine the effects on the American crocodile. This information should include site specific transportation methods to be used, location of all onshore facilities associated with OCS activities, an oil spill trajectory study including current direction/velocity information, and other pertinent information.

Schaus' Swallowtail Butterfly (Papilio aristodemus ponceanus)

The Schaus' swallowtail butterfly was listed as Threatened in the Federal Register on April 28, 1976. Prior to its discovery in Biscayne National Monument in 1971, this butterfly was on the verge of extinction due to overcollecting and habitat destruction by developers. It's distribution is limited to the areas of tropical hardwood hammocks around Biscayne National Monument.

The loss of suitable habitat would adversely affect the Schaus' swallowtail butterfly. However, since existing onshore facilities will be utilized, it is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of this species. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly any onshore development proposed for the Florida Bay area, will require Section 7 consultation.

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Bahaman Swallowtail Butterfly (*Papilio andraemon bonhotei*)

The Bahaman swallowtail butterfly was listed as Threatened in the *Federal Register* on April 28, 1976. The butterfly is found around Biscayne National Monument, living in the tropical hardwood hammocks.

Habitat destruction is a threat to the Bahaman swallowtail butterfly. Since the leasing and exploration activities will utilize existing facilities, it is my biological opinion that these activities are not likely to jeopardize the continued existence of this butterfly. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly any onshore development proposed for the Florida Bay area, will require Section 7 consultation.

Key Deer (*Odocoileus virginianus clavium*)

The Key deer was originally listed as Endangered in the *Federal Register* on March 11, 1967. The population ranges from 400 to 600 individuals. Loss of suitable habitat is the major reason for the Key deer's population decrease. The deer's range is restricted to the islands of the Lower Florida Keys, but only those islands with a permanent fresh water supply are used consistently. Big Pine Key and No Name Key support the largest deer populations.

Key deer will eat any available vegetation, but prefers red mangrove.

With the increase of urban development of the Florida Keys, the habitat of the Key deer is decreasing. Since the leasing and exploration activities will utilize existing onshore facilities, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the Key deer. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly onshore activities associated with development/production, will require Section 7 consultation.

There are seven additional species included in this consultation request which we will address together. They are the American peregrine falcon (*Falco peregrinus anatum*), the Eskimo curlew (*Numenius borealis*), the Everglade kite (*Rostrhamus sociabilis plumbeus*), the Cape Sable sparrow (*Ammospiza maritima mirabilis*), the Bachman's warbler (*Vermivora backmanii*), the Kirtland's warbler (*Dendroica kirtlandii*), and the Ivory - billed woodpecker (*Campephilus principalis*). These seven species, based upon their habitat needs, are not known to occur in areas where leasing and exploration activities could impact them. Therefore, it is my biological opinion that

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the leasing and exploration activities are not likely to jeopardize the continued existence of these species or destroy or adversely modify their Critical Habitat.

Florida Bay

Although this consultation is species oriented rather than being directly conducted for ecosystems, we feel it is appropriate to mention Florida Bay due to its unique character, fragility, and value to Endangered and Threatened species. Within the confines of this vast shallow bay with its associated myriad mangrove swamps and scattered keys, resident or migratory listed species include: the Arctic peregrine falcon, the brown pelican, the bald eagle, the Kemp's ridley turtle, the leatherback turtle, the green turtle, the loggerhead turtle, the Florida manatee, the American crocodile, the Key deer, the Bahaman swallowtail butterfly, the Schaus' swallowtail butterfly, and several proposed plants.

About 20 years ago, several onshore and offshore wells were drilled and subsequently abandoned in the Florida Bay area. At that time, however, the human development of this area was not as extensive nor was the stress placed on the Endangered and Threatened species as great. We have identified this area as a sensitive area and thus exploration or development/production activities proposed in this area may affect Endangered species and will require Section 7 consultation. Additional information will be needed at the time of consultation. This will include an oil spill trajectory study, the type and amount of activities, and the secondary activities which could result.

This information is required to facilitate the FWS in our determination as to whether activities or programs are likely to jeopardize the continued existence of a species or destroy or adversely modify its Critical Habitat.

Cumulative Effects

There are numerous offshore and coastal projects and activities throughout the Gulf of Mexico. Those which could have an impact on the Endangered and Threatened species considered in this regional Gulf oil and gas leasing and exploration consultation will be presented by state.

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Texas

The U.S. Army Corps of Engineers (Corps) has numerous maintenance dredging projects underway or proposed. These maintenance projects include dredging in the Intracoastal Waterway and the ports along the eastern Texas coast.

There are two Corps projects which are not maintenance dredging. They are the widening of the Texas City Channel and turning basin, and the widening of the Brownsville Ship Channel and turning basin. In addition, there are two private dredging projects proposed for this area. The first is a plan to enlarge Sabine Pass to accomodate large ships unloading butane and propane. The second is to enlarge Galveston Harbor and Channel, again to accomodate large petroleum product carriers.

There is a deepwater port proposal for Corpus Christi, Texas. The FWS has recommended that one of the alternatives be adopted instead of the original proposal. The recommendation is to place the deepwater port offshore using a single point mooring system.

There is a liquified natural gas (LNG) plant proposal for Matagorda Bay. This proposal is still in the study stage. Another proposal involves the establishment of strategic petroleum reserves in Texas. The proposed locations are Big Hill salt dome in Jefferson County; Nash salt dome in Fort Bend County; and Bryan Mound salt dome, Allen salt dome, Damon Mound salt dome, and West Columbia salt dome in Brazoria County. These strategic petroleum reserves will store petroleum for an infinite amount of time. When the storage areas are first established, the brine pumped from the salt domes will be discharged into the Gulf. After the salt dome petroleum reservoirs are full, brine reservoirs will be created for disposal of brine when oil is extracted from the storage areas. If there is excess brine at this time, it will be discharged into the Gulf.

There was a former proposal, Seadock, Inc., to construct a deepwater port off the coast of Freeport. The Coast Guard placed operational restrictions on the proposal and it was dropped. Recently, the State (Texas) has picked up the proposal and is conducting feasibility studies on the project now renamed the Deep Water Port Authority. The project will utilize a single point mooring system 26 miles from Freeport where large petroleum transporters will unload their cargoes which will then be piped to shore through a 52-inch diameter pipeline.

Geothermal/geopressure development is a new type of resource development being studied in the Gulf. The Bureau of Economic Geology at the University of Texas is presently under contract from the Department of Energy to develop the technology and hardware to utilize the heat and pressure produced. The University is presently drilling a well near Freeport to measure the amount

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of heat and pressure that is produced over a period of time, and then will calculate how much can be recovered. The brine for geothermal/geopressure drilling will be reinjected into a lower pressure reservoir.

Louisiana

The Corps has numerous maintenance dredging projects along the coast in the ports and in the Intracoastal Waterway. There are two Corps projects which are not maintenance dredging projects. The first is the enlargement of Atchafalaya River and the Chene, Beouf, and Black Bayou to accomodate large offshore drilling equipment. The second project is to alleviate the navigation hazards along the Bayou Lafourche and the Bayou Lafourche-Jump Waterway. They will be dredging the auxiliary channel.

The Louisiana Offshore Oil Port (LOOP) project began construction in October 1977, and will be completed in December 1989. There are three phases to the construction of the LOOP and upon completion there will be six single point mooring systems where foreign petroleum tankers can unload their cargo. From the mooring systems, the cargoes will go through a pipeline (56-inch diameter) to the offshore terminal. This offshore system will be located 18 miles offshore from Galliano. From the terminal, the cargoes will go through a pipeline (48-inch diameter) to the salt dome storage (56,000,000 barrel capacity) at Galliano. From the salt dome storage, petroleum will be pumped via a 42-inch diameter pipeline to St. James Parish for processing or distribution. When the salt dome cavities are first established, the associated brine will be discharged into the Gulf through a 36-inch diameter pipeline near East Timbalier Island. After the cavity formation, a 25,000,000 barrel brine reservoir will be created for use in emptying the cavities when the oil is extracted. When these cavities are being filled and emptied, any brine in excess of the brine reservoir capacity will be discharged into the Gulf. The initial operation will begin in May 1980.

There are potential strategic petroleum reserve sites in Louisiana also. They would function on the same principal as those proposed for Texas. The potential sites are Napoleonville salt dome in Assumption Parish; Bayou Choctaw salt dome in Iberville Parish; Chacahoula salt dome in Lafourche Parish; Cote Blanch Mine in St. Mary's Parish; West Hackberry salt dome and Black Bayou salt dome in Cameron Parish; Vinton salt dome and Sulfur Mines in Calcasieu Parish; and Weeks Island salt dome and Iberia salt dome in Iberia Parish.

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Mississippi/Alabama

The Corps has several maintenance dredging projects scheduled and proposed for Mississippi and Alabama including the Intracoastal Waterway. There is a new project in Mobile Bay, Alabama in which the Corps will widen and deepen the Theodore Ship Channel to provide a turning basin.

Florida

There are a number of Corps maintenance dredging projects in various ports and in the Intracoastal Waterway.

There are also several new dredging projects. The deepening of Tampa Bay is presently underway and will take three to five years to complete. There is a proposal to improve the navigation conditions in the Apalachicola River. This would involve a dam or the deepening of the channel. A feasibility study to make Port St. Joe a deepwater port is presently being conducted. The deepening of Port Manatee and the construction of an electric manufacturing plant at that site is another project. There is a minor port at Boca Grande which is being considered for expansion into a deepwater port and the possible association of an offshore terminal. There is presently a petition to the Corps to alter the drainage patterns of Turkey Creek and Indian River toward the east coast of Florida and the St. Johns River toward the west coast.

The Florida Power Corporation is installing two more generating units at the Crystal River Electric Generating Plant. Commercial service will start in 1982 for one unit and 1983 for the other. An access road and railroad spur are needed.

There is an uranium oxide extraction plant which may start construction as early as April 1, 1979, in Tampa.

The crude oil refinery near Port Manatee will start producing early in 1979. It will produce about 15 to 20,000 barrels of petroleum products per day.

Previous OCS lease sales have proposed the use of Tampa/Port Manatee, St. Petersburg, and Pensacola as possible sites for onshore exploration and development/production facilities. As stated in this biological opinion, the use of ports other than Tampa/Port Manatee (with the stated restrictions) will require Section 7 consultation.

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Conclusion

Based on my consultation team's review of the above information and other information and data available to the Service, it is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of the Endangered or Threatened species considered herein or result in the destruction or adverse modification of their Critical Habitats with the exception of the Florida manatee. Exploration activities may jeopardize the continued existence of the Florida manatee or adversely modify its Critical Habitat unless Tampa/Port Manatee is utilized as stated in the species account above.

However, should construction of additional onshore facilities be needed or a change in the use of existing facilities be required as leasing and exploration activities expand, especially into the western and eastern Gulf of Mexico, Section 7 consultation will be required. Since it has been determined that development/production activities may affect Threatened or Endangered species, Section 7 consultation will be required between the Geological Survey and the Service.

Should a new species be listed, additional information become available, additional onshore facilities be needed for exploration activities, or the project description, as discussed above, be changed, Section 7 consultation will be required. Any activity or program which is authorized, funded, or carried out by a Federal agency which may affect any Endangered and Threatened species will require Section 7 consultation. I would like to remind the Bureau of Land Management and the Geological Survey of their continuing responsibility, under the Endangered Species Act, to remain cognizant of the status of the Endangered and Threatened species in the Gulf of Mexico, and to recognize potential problems which may develop from Federal activities or those activities requiring Federal authorization or funding. If such a problem arises, Section 7 consultation may be required.

/s/ Lynn A. Greenwalt

cc: Directorate Reading File
DD Chron File
AFA File

FWS/OES:NSweeney:mc 3/30/79
FILE 375.4

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ENDANGERED SPECIES ACT

Section 7 Consultation - Threshold Examination

Agencies: Bureau of Land Management (BLM) and U.S. Geological Surevey (USGS)

Activity: Gulf of Mexico lease sales, exploration, transportation, termination, development and production.

Consultation Conducted by: National Marine Fisheries Service.

Results of Threshold Examination:

Under Section 7 of the Endangered Species Act of 1973 (the "Act"), as amended, each Federal agency must ensure that any action authorized, funded, or carried out by such agency does not jeopardize an endangered or threatened species. Under the Section 7 consultation process established by the Act, the Secretary of Commerce is required to provide the Federal agency concerned an opinion detailing how the proposed agency action affects any threatened or endangered species within the Department's jurisdiction or the critical habitat of such species. In addition, the Secretary must suggest reasonable and prudent alternatives which would avoid jeopardizing the continued existance of such species or adversely modifying its critical habitat and which can be undertaken by the agency in implementing its action.

By letter of November 28, 1978, the Bureau of Land Management, Department of the Interior, requested initiation of a regional Section 7 consultation with the National Marine Fisheries Service on the Outer Continental Shelf oil and gas leasing program in the Gulf of Mexico.

As part of the consultation process, a meeting was held in New Orleans, Louisiana, on February 9, 1979 with representatives of the Bureau of Land Management, the U.S. Geological Survey, and the National Marine Fisheries Service.

Formal consultation was requested for the following species:

Humpback whale	Megaptera novaeangliae
Right whale	Eubalaena glacialis
Sei whale	Balaenoptera borealis
Blue whale	Balaenoptera musculus
Finback whale	Balaenoptera physalus
Sperm whale	Physeter catodon
Leatherback turtle	Dermochelys coriacea
Hawksbill turtle	Eretmochelys imbricata

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Kemp's Ridley turtle	Lepidochelys kempii
Green turtle	Chelonia mydas
Loggerhead turtle	Caretta caretta

Eastern Gulf of Mexico:

These Federal actions involve the offering of 116 tracts for leasing for the extraction of oil and gas. The tracts are located on the Outer Continental Shelf in areas located west, south, and east of that portion of the states of Florida, Alabama, Mississippi, and Louisiana that border on the Gulf of Mexico. The largest portion of the proposed lease offering is located off the coast of Florida.

With two exceptions, each tract contains 5,760 acres (2331.04 hectares). Tract 65-32 contains 5454.72 acres and Tract 65-71 contains 5134.56 acres.

The total area offered in all tracts amounts to 667,229.28 acres (270,023.99 hectares). The tracts are located between 10 statute miles (16 kilometers) to 119 statute miles (190 kilometers) from shore. The water depths range from 60 feet (18 meters) to 1,150 feet (350 meters). Thirty-three of the tracts are located in areas where the water depth is equal to or greater than 200 meters.

Seventy-five of the tracts proposed for offering are believed to have potential for oil and gas production, and the remaining 41 tracts are believed to be potentially oil productive.

No commercial oil and gas production has been found on the Outer Continental Shelf in this region and no marine oil and gas production has been established in this portion of the Gulf of Mexico; therefore, no facilities for the production and transportation of crude and natural gas have been installed on the Outer Continental Shelf in the vicinity of the tracts proposed for leasing.

The U.S. Geological Survey estimates that between 15 and 150 million barrels of oil and 20 - 175 billion cubic feet of natural gas may be produced as a result of this proposed sale. The production rates may be estimated at between 2,500 and 24,000 barrels of oil per day and between 4 and 32 million cubic feet of gas per day. The daily rates are estimated as rates applicable to when development is complete and production stabilizes.

A. Exploration:

Following the awarding of leases, the successful bidders can be expected to drill exploratory wells in order to locate and delineate the areal extent of oil and gas deposits. The most likely number of exploratory wells to be drilled would be 75. These wells will probably be drilled by moveable offshore drilling units.

B. Development and Production:

After the completion of exploratory drilling, platforms would be designed, constructed, and placed in position. Development wells will be drilled from platforms. The most likely number of platforms to be installed is 25, and the most likely number of development wells is 225. Underwater completions may also be utilized. Support facilities for this activity could be located in the Tampa, Panama City, or Mobile areas. The expected production life is 25 years.

C. Transportation:

The most likely method of transportation that will result from the proposed sale will be pipeline transportation of natural gas to shore points in the vicinity of existing onshore natural gas pipelines.

The most likely system for the transport of crude oil would be pipeline transport to onshore storage facilities and transportation from these terminals to existing refineries by surface marine transport. The most likely pipeline mileage that may be installed is 700 miles. Probable destination points and locations of oil terminal facilities and gas processing plants are the Manatee/Tampa area and the Mobile/Pensacola area.

A possible alternative gathering and transportation system could include the provision of offshore storage on the OCS and direct transportation from these facilities to existing refineries.

D. Termination:

Title 43, 3307.3-4 and 3307.3-6 provide for the removal of all structures when no longer required for operations. The removal must be completed within a period of one year following the expiration of the lease, and the structures must be removed to a sufficient depth beneath the surface of the waters to prevent them from being a hazard to navigation and the fishing industry.

OCS Order No. 3 requires that all casing and piling shall be severed and removed to at least 15 feet below the Gulf floor and the location shall be dragged to clear the well site of any obstructions.

This proposed action must be viewed as one part of a continuing activity that has been underway since the 1940's. Although primary emphasis has been placed on this particular sale, it should be put into the perspective of an on-going offshore oil and gas development process. As of June 23, 1977, there have been 34 OCS oil and gas (and five OCS sulfur and salt) lease sales on submerged lands in Federal areas of the Gulf of Mexico.

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Currently, the Bureau of Land Management holds 495 permits on the OCS resulting in 5,862 miles of offshore pipelines. These figures are as of October 31, 1977, and exclude 12 pending applications.

As production declines in existing areas, much of the equipment, transportation facilities, and personnel can be used for new areas of activity. As existing areas of production decline, the pipelines in place can be used for new production areas, adjacent or further from shore, reducing the number of pipelines necessary to transport production from new areas to shore. This latter event has already been exercised in some areas of offshore Louisiana. Likewise, a reduction in quantity of onshore facilities, such as treatment plants, refineries, storage facilities, etc., is made possible by utilizing existing facilities, equipment, and technology.

Proposed OCS planning schedules are developed in order to project the timing, size, and location of specific sales for an OCS leasing program. The goal of the proposed schedule is to provide for orderly development of OCS oil and gas in order to maintain an adequate contribution of OCS production to the national supply and to provide early information concerning areas proposed for leasing activities.

Western and Central Gulf of Mexico:

These proposed lease sales would provide for the orderly and timely development of oil and gas reserves expected to occur on 115 tracts on the Outer Continental Shelf (OCS) in Federal waters in the Gulf of Mexico offshore of Texas, Louisiana, Mississippi and Alabama.

These tracts include approximately 545,255.24 acres and range from 3 to 165 nautical miles (6-189 kilometers) from shore in water depths of 6 to 500 meters. Approximately fifty-eight percent of these tracts are gas prone, four percent are oil prone, and thirty-eight percent are both oil and gas prone.

Surveys indicating seismic refraction, seismic reflection, gravity, magnetics, bright spot technology, and stratigraphic correlation are collected before and after leasing to assist in the determination, location, and magnitude of petroleum resources. Surface vessels of the 50 to 300 ton class are utilized to perform geophysical surveys. In general, seismic surveys record the behavior of shock waves through various rock formations. This information is used to determine the presence of salt domes, folds, faults and sediment thickness.

A. Exploration:

After a lease has been issued, shallow surveys defining geologic hazards, bottom stability, cultural resources and other conditions which might affect exploratory drill site locations are performed. Once a location has been selected, exploratory drilling begins. These drilling operations are basically the same regardless of the type of mobile rig utilized (jack-up rigs, drillships or semi-submersibles). Initially, a drive pipe is installed along with a blowout preventer. The actual drilling process involves the use of introduced muds which acts as lubricants, coolants, and pressure controls. Cuttings or a mixture of mud and drilled materials are a product of the drilling process. Sixty to 160 exploratory wells may be drilled as a result of this action.

B. Development and Production:

When petroleum discoveries are made and the extent of a field has been determined, a plan of development is devised. As a result, 10 to 25 multi-well platforms may be established with the drilling of 60 to 150 production wells.

The production phase of OCS oil and gas operations consists of bringing the product to the surface and preparing it for transport. This phase of the operation may go on for as long as 20 years. Formation waters of reservoir brines are produced in the oil and gas production process.

C. Transportation:

The principal means of getting gas and oil resources in the Gulf of Mexico from production areas offshore to processing and storage locations onshore has been and will continue to be via pipelines. Additionally, the labor force, equipment and supplies needed to service the various stages of offshore operations are transported by crewboats, barges and helicopters. As a result of this proposed action, 100 to 200 miles of new pipeline may be laid. These lines would run from new production facilities offshore and connect with the existing pipeline system to onshore facilities. It is anticipated that no new pipelines to facilities onshore will be required.

D. Termination:

When a reservoir has been depleted to a level at which it cannot produce profitably, operations are terminated. According to industry estimates, with proper placement of wells and sufficient pipeline capacity, a gas reservoir could be drained in as little as 10 years. In contrast, some oil reservoirs have been producing for over 20 years.

OCS orders issued by the U.S. Geological Survey require wells to be plugged, the casing severed adequately below the mudline, the platform removed, and all obstructions cleared from the area. Major trunklines may be used for future production from adjacent areas, but smaller lines would probably be abandoned in place. Abandonment of pipelines consists of flushing the lines of entrained hydrocarbons by water, disposing of the water onshore, and severing the ends below the mudline.

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Endangered Species Impacts

Whales:

The posible impacts on whales and their critical habitat from exploratory and development/production activities were given thorough consideration. These included the following:

1. Seismic - It is the opinion of the Consultation Team that no unfavorable impacts would result from seismic operations.

2. Oil Spills - Conceivably, a large oil spill occurring in the immediate vicinity of whales could be harmful because of the possible intake of oil through the blow hole, fouling of the baleen plates, and indirectly from the ingestion of oil contaminated food. However, endangered cetaceans are uncommon in the lease/sale area and are sighted only on rare occasions. Therefore, even if an oil spill occurred in the tract areas, it is unlikely that any endangerd whales will be affected. In addition, there is no historical record of such an occurrence.

3. Boat traffic - Due to the migratory nature of whales, the small increase in boat traffic would have a minimal (non-measurable) impact.

Turtles:

The following exploratory and production/development activities were reviewed to determine possible impacts on sea turtles and their critical habitat:

1. Seismic - None.

2. Oil spills - The effect of oil spills is not known. However, oil ingestion or physical contact by turtles, especially with the eyes and nostrils and particularly in hatchlings entrapped in a spill, could be lethal. Hatchling and juvenile turtles are believed to be passively distributed by surface currents, the same mechanism that spreads oil. None of the five species of sea turtles that are found in the Gulf of Mexico occur in concentrated numbers of assemblages in those waters, and oil spills in limited areas would not be expected to impact on more than a few individuals at sea. Oil spills, however, could have severe impacts on nesting beaches if washed ashore at nesting seasons. Therefore, every effort to minimize the potential for spills should be exercised.

3. Boat traffic - As with whales, the small increase in boat traffic would have a minimal impact on sea turtles.

4. Drilling - Platforms and pipelines may increase habitat by creating "live-bottom" topography. Turtles have been observed to feed on sessile organisms attached to platforms. During the period from mid-

summer to mid-fall, lights on drilling platforms near shore could attract hatchling turtles resulting in abnormal concentrations. These disoriented turtles would possibly be subjected to increased predation. It is recommended that monitoring of the effect of lights, particularly on hatchling loggerheads, be conducted to determine the significance of their impact.

Biological Determination and Need for Additional Information or Further Consultation:

After a careful review of the findings by the Consultation Team, it is my biological opinion that the proposed project is not likely to jeopardize the continued existence of the endangered or threatened species listed above or result in the destruction or adverse modification of habitats determined to be critical to them. This biological opinion is based on the general information in the EIS concerning possible effects of the proposed actions and does not relieve BLM or USGS of the continuing responsibility of reviewing their activities and programs in light of their Section 7 consultation should new information reveal impacts of the identified activities that may affect listed species or their habitats, or these activities are subsequently modified, or a new species is listed that may be affected.

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In Reply Refer To:
FWS/OBS 375.0

August 18, 1978

Memorandum

To: Director, Geological Survey

From: Acting Director

Subject: Section 7 Consultation - Proposed Exploration Plans for OCS in Gulf of Mexico

This responds to your July 26, 1978, request for initiation of Section 7 consultation on the pending exploration plans for the Outer Continental Shelf (OCS) blocks in the Gulf of Mexico identified as Matagorda Blocks 591, 601 and 687, Brazos Block A-132 and North Padre Island Block 884.

Because of the complexity of the subject, I am appointing a Section 7 consultation team to carry out the consultation process with the Geological Survey (USGS). The following representatives are hereby appointed to the consultation team:

David Watts - Office of Endangered Species
Gary Halvorson - Region 2, Albuquerque, New Mexico
Russel Peterson - Region 2 Area Office, Galveston, Texas

We anticipate the process to begin on August 21 when the consultation team will meet with your representatives at the USGS Metairie, Louisiana Office. Please contact Mr. Gary Halvorson, FTS 474-4974, if we can be of further assistance in this matter.

/s/ Harvey Nelson

cc: Directorate Reading File
DD Chron File

FWS/OCS:DWatts:mas 8/15/78

- CONFORMED COPY -

On August 22-23, the consultation team met with your representatives and other biologists of the Fish and Wildlife Service (FWS) to discuss the proposed exploration plans and the anticipated effects on the listed species identified above and their habitat. Representatives of three of the producers were there for an introductory comment period and to answer technical questions prior to the commencement of the consultation between USGS and the FWS concerning the exploration plans. A list of participants is attached.

The consultation team reviewed numerous reports, publications, and correspondence from knowledgeable sources on the species in question and, in addition, numerous telephone contacts were made with other experts. Information contained in the exploration plans was carefully evaluated to ascertain their effects on the listed species and their habitats. Copies of pertinent reports and documents are included in an administrative record maintained at the Office of Endangered Species and are incorporated by reference.

Tracts proposed for exploration herein are classified as "gas prone", i.e. one expected to deliver primarily gas during exploration, production and development.

After issuance of the OCS leases by the Secretary, Department of Interior, primary regulatory authority for the exploration, production and development of the lease tracts shifts to USGS and other Federal agencies identified in the Environmental Impact Statement prepared prior to the OCS lease sale. The projected development schedule (copy attached) identifies the various steps requiring USGS approval and approximate time frames for completing production after the award of a lease.

A brief description of the tracts considered is provided:

1. Block Number BA A-132 is leased by the Atlantic Richfield Company. It is located 43 miles from Matagorda Island and has nine exploratory wells proposed. The base of supply for both helicopter and boat access will be at Freeport, Texas.

2. Block Number MI 591 is leased by Sonat Exploration Company and located 10 miles from the Texas coast. Only one exploratory well is proposed at this time. The base of supply for both helicoptor and boat access will be at Port O'Connor, Texas.

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3. Block Number MI 601 is leased by Sonat Exploration Company and is located 10 miles from Texas coast. Only one exploratory well is proposed for the location at this time. The base of supply for both helicopter and boat access will be at Port O'Connor, Texas.

4. Block Number MI 687 is leased by Continental Oil Company and is located 22 miles from the Texas coast. A maximum of four exploratory wells are proposed for the block. The base of supply for both helicopter and boat access will be at Port O'Connor, Texas.

5. Block PI 884 is leased by Mobil Oil Corporation and is located 12 miles from the Texas coast. Five exploratory wells are proposed for the block at this time. Although the original base of supply was stated to be Rockport, Texas, it has since been changed to Ingleside, Texas for boat access and Corpus Christi, Texas for access by helicopter.

6. Block Number Mustang Island A-149 is leased by American Natural Gas Production Company and is located 50 miles from the Texas coast. Six exploratory wells are proposed for the block at this time. The base of supply for both helicopter and boat access is to be either Rockport or Corpus Christi, Texas.

7. Block Number MI 634 is leased by Cities Service Company and is located 17 miles from shore. Three exploratory wells are proposed for the block at this time. The base supply for both helicopter and boat access is to be Port O'Connor, Texas.

8. Blocks PI 948, 955, 956, 966, and 967 are leased by Atlantic Richfield Company and are located 27 miles from the Texas coast. No exploratory wells are proposed for blocks 955, 966, or 967 at this time. Three wells are proposed for block 948 and four wells are proposed for block 956. The base of supply for both helicopter and boat access to the area is to be either Freeport or Ingleside, Texas.

A summary of the biological data and considerations of the consultation team is provided for the 3 listed species.

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Whooping Crane (*Grus americana*)

The whooping crane was listed originally as Endangered on March 11, 1967. Its wild breeding population nests in Wood Buffalo National Park, Northwest Territories, Canada, and winters from October to April on and adjacent to the Aransas National Wildlife Refuge in the Texas coastal area. Their migratory range includes the Canadian provinces of the Northwest Territories, Alberta, Saskatchewan, Manitoba, and the States of Montana, North and South Dakota, Nebraska, Kansas, Oklahoma, and Texas. Whooping crane Critical Habitat was proposed on December 16, 1975, in the *Federal Register*. Nine areas of whooping crane Critical Habitat were determined on May 15, 1978, in the *Federal Register* and became effective June 14, 1978. A portion of this habitat includes their wintering environment in Aransas, Calhoun and Refugio Counties, Texas.

The total population numbers a little over 100, though the wild Texas population as of August 1978 numbers about 70. This represents a modest increase over the 21 known birds reported in 1941 and may be indicative of a continuing expansion of the whooping crane population.

Parents and young-of-the-year remain together as families for nearly a year, separating on the return to their muskeg nesting areas in Canada. Salt flats, including ponds and estuaries, are typical winter habitat.

In Texas their preferred foods include blue and fiddler crabs, clams and mudshrimp from saltwater areas, and frogs, crayfish, and snails from freshwater ponds.

Factors which contributed to the decline of the whooping crane include the loss of habitat, overutilization of the species, and a low reproductive potential.

Since the whooping crane's major diet occurs in water, an oil spill could prove harmful to the species. The whooping cranes feed in water by probing into mud and, on occasion, may be submerged up to their shoulders. Further, its wading habits could result in oil coating its feathers in the event of an oil spill. And lastly, ingestion of oil coated prey may be adverse to the individual bird's well-being and could prove harmful to the species.

Exploration activities associated with OCS leases on the following locations: Brazos Block A-132, Matagorda Blocks 591 and 601 and 687 and 634, North Padre Island Blocks 884 and 948, 955, 956, 966, 967,

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and Mustang Island Block A-149, are not likely to jeopardize the whooping crane's continued existence or adversely modify or destroy habitat which has been determined as critical to the survival and recovery of the species. There is no information to indicate that an oil spill of sufficient quantity to be adverse to the species will occur in those areas frequented by the whooping crane. This is based upon the knowledge that the closest tracts to habitat utilized by this species are approximately 13 miles distant and considered to be gas prone. Further, within approximately 90 miles of this habitat, all of the tracts (areas of South Padre Island East Addition, North Padre Island East Addition, Mustang Island, Mustang Island East Addition, Matagorda Island, Brazos, and Brazos South Addition) are gas prone which indicates there exists a small potential for oil spill impacts.

Response capabilities have been developed to deal with spills of oil and other hazardous substances both offshore and in coastal waters. Clean Gulf Associates stores various types of clean up equipment at locations along the gulf coast, including Rockport and Galveston, Texas. That organization also provides trained supervisory personnel to direct clean up efforts. Most spills in the Corpus Christi and Aransas Bay areas are handled by the Corpus Christi Oil Spill Control Association. This association stores its equipment in Corpus Christi and has a significant amount of experience in dealing with spills. Less equipment and fewer experienced personnel are located in the Port O'Connor area at the northern end of the whooping crane Critical Habitat. At least two private concerns and the Coast Guard's Port O'Connor office have clean up equipment and are capable of responding to relatively small spills in that area. The Corpus Christi Oil Spill Control Association occasionally backs up clean up efforts in the Port O'Connor area.

However, if any activity or program authorized, funded, or carried out by a Federal agency may affect the whooping crane or its habitat, Section 7 consultation will be required. These actions could include 1) the operation of Service, crew, and barge vessels at and/or between Port Aransas and Port O'Connor which may increase the incidence of boat collisions resulting in the release of petroleum products and other chemical contaminants into whooping crane habitat. 2) the construction and operation of pipelines and associated facilities, 3) the construction and operation of support bases, 4) the construction and operation of onshore development facilities, and 5) the use of fixed-wing aircraft lower than an elevation of 500 feet and helicopters lower than 1000 feet during the period of October 15 through April 15, annually, over areas utilized by whooping cranes. Based on the information provided

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by USGS, operations conducted out of Port O'Connor to service Matagorda Blocks 591, 601, 687 and 634 will utilize Cavello pass; operations out of Ingleside and Rockport will utilize Aransas Pass and neither transportion plan will necessitate consistent or regular vehicle traffic through the Critical Habitat area.

Brown pelican (Pelecanus occidentalis)

The brown pelican was listed originally as Endangered on October 13, 1970 The bird normally ranges on the eastern seaboard from North Carolina to Florida and around the gulf coast of Texas and Mexico, southward to Venezuela as well as the West Indies and islands of the Caribbean. A small population of about 50 invividuals exists in Texas and is increasin slowly. Louisiana populations are those restocked from Florida since 1968, plus offspring from those birds since 1971. This new population suffered a decline of approximately 40 percent from Endrin pollution in 1975 and now numbers about 200 birds. Both Carolina populations are relatively small and nearly stable. In Florida a stable population of 20,000 - 30,000 is reported. Critical Habitat has not yet been determined for this species.

The major food of the pelican is fish, including menhaden, mullet, sardines, and pinfish. The pelican catches these fish by plunge-diving in coastal waters. Brown pelicans are rarely found away from saltwater and typically do not venture more than 20 miles (32 km) out to sea. Extensive use of pesticides which were ultimately ingested by the brown pelican has been noted as the primary cause of the current population decline.

The brown pelican is extremely susceptible to disturbance and habitat alteration of key nesting areas. It is imperative to prevent disturbance of nesting colonies that could cause nest desertion and egg losses. Transport operations conducted out of Port O'Connor and Ingleside/ Rockport through Aransas pass should be cognizant of and avoid disturbance of the following nesting islands: Sundown Island in Matagorda County, Second chain of islands in Aransas County, Long Reef in Aransas County, and Pelican Island in Nucces County.

None of the presently considered impacts of the proposed exploration of OCS tracts, however, are considered of sufficient probability or magnitude to be likely to jeopardize the continued existence of the brown pelican. However, any activity or program resulting from this proposed sale which is authorized, funded, or carried out by a Federal agency and which may affect active nesting sites or sites necessary for expansion of nesting (identified in the draft Brown Pelican Recovery Plan) will require Section 7 consultation.

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Atlantic Ridley (*Lepidochelys kempii*)

The Atlantic Ridley sea turtle was listed orginally as Endangered on December 2, 1970. By Memorandum of Understanding with the National Marine Fisheries Service (NMFS), jurisdiction of the Ridley, for matters relating to the Endangered Species Act of 1973 rests with the NMFS while the Ridley is in its aquatic environ, and with the FWS while onshore.

The Endangered Atlantic Ridley sea turtle inhabitats the Gulf of Mexico. Ridleys occur along the Atlantic coast as far north as Massachusetts and are sighted infrequently along European shores. Critical Habitat has not been determined for this species. The essential habitat of the Atlantic Ridley includes shallow coastal and estuarine waters often associated with subtropical shorelines of red mangrove. In the U.S. this species is believed to sporadically nest in Kleberg, Kenedy, Willacy and Cameron Counties, Texas. The entire population now nests primarily on approximately 24 km of beach in the State of Tamaulipas, Mexico. Nesting female population estimates for 1947 were 40,000; 2,000 to 4,000 in 1973; and 400 to 500 in 1976. Currently, there exists an International Inter-governmental project to reestablish a viable population on Padre Island National Seashore. In 1978 turtle eggs were collected in Mexico and hatched and imprinted in the U.S.

Portunid crabs (*Callinectes* sp.) make up a large portion of the diet. These turtles also feed on other crabs, shrimp, snails, echinoderms, medusae, and fish. The northern gulf off the coast of Louisiana has been identified as a major feeding area.

Commerical harvesting of the Atlantic Ridley and their eggs has played a significant role in the decline of this species. Predation by crabs, fish, reptiles, birds and mammals is acute, especially on eggs and hatchlings. Predation on adults is limited to sharks. Atlantic Ridleys also are caught incidental to commercial fishing activities which result in entanglement and subsequent drowning in the trawlers' nets.

Although the Atlantic Ridley is believed to nest on Padre Island and on the beaches of Kleberg, Kenedy, Willacy and Cameron Counties on the Texas gulf coast, the proposed sale and subsequent activities are not likely to jeopardize the continued existence of the Atlantic Ridley sea turtle unless development involves Padre Island and the above mentioned counties. Should future actions involve Federal agencies authorizing,

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funding, or conducting activities or programs on Padre Island or the beaches of Kleberg, Kenedy, Willacy and Cameron Counties, Texas, especially the restoration and enhancement efforts for the Atlantic Ridley turtle population on Padre Island National Seashore, Texas, Section 7 consultation will be required.

Conclusion

Based on my consultation team's review of the above information and other information and data available to the Service, it is my biological opinion that exploration of the identified OCS tracts, subject to the previously stated conditions, is not likely to jeopardize the continued existence of the Endangered species considered herein or result in destruction or adverse modification of their Critical Habitats. The conclusion is predicated on data provided concerning helicopter and vessel routes and their frequencies. Any Federal action that is authori funded, or carried out that significantly increases the boat trips throu Critical Habitat of the whooping crane and proportionately increases the risk of collision and/or oil and hazardous substances spill will require reinitiation of Section 7 consultation. Similarly, any Federal action which poses a threat of disturbance to brown pelican nesting islands or Atlantic Ridley nesting beaches on Padre Island will require reinitiation of Section 7 consultation.

Attachment

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United States Department of the Interior
GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

In Reply Refer To:
EGS--Mail Stop 630

JUL 26 1978

Memorandum

To: Director, Fish and Wildlife Service

From: Acting Director, Geological Survey

Subject: Endangered Species Act, Section 7, Consultation, Outer Continental Shelf off Texas

A formal consultation, under 50 CFR 402.4, which implements Section 7 of the Endangered Species Act, is requested to obtain your "Biological Opinion" for the potential impact of four pending plans of exploration for activities off South Texas.

The oil and gas exploration and development activities which are permitted from the Geological Survey's Metairie office are located seaward of the shoreline in Federal waters. We request your advice on the endangered species which may be impacted by these activities. Informal consultation by our Metairie office with your field personnel revealed concern for the whooping crane's critical habitat use during the period from October 15 through April 15.

The offshore activities for the pending exploration plans are located in Matagorda Blocks 591, 601, and 687, Brazos Block A-132, and North Padre Island Block 884. The onshore support bases are located at Port O'Conner, Rockport, and Ingleside, Texas. The exploration plans and environmental report are enclosed for your information. Please note that some of the activities could occur during the season when the whooping cranes are in Canada and, thus, would not affect them while they are at that location.

Your formal consultation meeting should be scheduled with A. Dewey Acuff, Conservation Manager, Gulf of Mexico Region, P.O. Box 7944, Metairie, Louisiana 70011. Mr. Acuff can be reached at (504) 837-4720 or FTS 680-9381.

Acting Director

Enclosures

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END

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